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I've written something for TIGERPAPER, how about you?

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Musk Deer

MOUNTAIN MAMMALS IN PAKISTAN

by George B. Schaller

The Hindu Kush, Himalaya, and Karakoram ranges meet in northern Pakistan to form a tremendous mountain region some 100,000 sq. km. in extent. The summer monsoon reaches the southern hills, making them quite lush; with forests of oak, fir, pine and other trees up to the timberline at about 4,000 m. Further north, beyond the towns of Chitral and Gilgit, the ranges are bleak and cold. With precipitation of less than 50 cm. per year, much of it as snow, the terrain is of desolate glaciers and rock and wind-flayed slopes sparsely dotted with *Artemisia, Ephedra,* and other low shrubs. Alpine meadows and groves of birch and willow hug the stream edges or grow on sites nurtured by meltwater from the perpetual snows.

But these remote and inhospitable mountains support a large human population. In the fertile southern portions most forests have been cut and the slopes converted into terraced fields. In the arid areas, where irrigation is necessary to grow crops, villages and fields occupy almost every level piece of ground and every alluvial fan at the mouths of streams up to an altitude of 3,400 m. Sheep, goats, yaks, and other livestock forage up to 4,700 m. close to the vegetation limit. Wood-cutters fell the gnarled junipers on the crags for fuel, and when these are gone rip *Artemisia* and other shrubs from the fragile slopes.

In spite of this enduring pressure of man, the mountains once supported much wildlife as numerous hunting accounts from the past century and up until about 40 years ago indicate. Political tensions with neighbouring countries and internal conflicts have had a detrimental effect on wildlife populations in Pakistan, thus very little information about the nation's fauna has been compiled in the past 40 years.

I was fortunate, however, to be able to spend 11 months in these mountains (from 1970 to 1975) where I studied selected animal populations – especially wild goats and native sheep, both of which are threatened with extinction in Pakistan (read "Punjab Urials – Almost Gone in Pakistan" in **TIGERPAPER** III:3) – and made surveys on as many species as possible. Some mammals, such as Eurasian otter *(Lutra lutra)* and lynx *(Felis lynx)* were so rare that I could do little more than record their presence, other animals including black bear *(Selenarctos thibetanus)* and muskdeer *(Moschus moschiferus)* are localized forest species and very little information was gathered about them. Fortunately, I was able to study several other species in detail and present the following notes and comments for your information.

Markhor. With their long, spiralling horns and flowing neck ruff, markhor *(Capra falconeri)* is the most distinctive of the wild goats. Two subspecies, the Kashmir and Astor markhors, are said to occur in northern Pakistan. While I continue to use these common names, the two forms are best placed into one subspecies, *C. f. megaceros.* Their habitat require-

ments include cliffs onto which they can escape in times of danger, and some suitable terrain below 2,200 m. where the temperature remains moderate in the winter. Although in the summer they may go as high as 4,000 m., their low tolerance of cold has restricted them to low-lying valleys such as the Indus. Otherwise they are ecologically quite tolerant, existing both on treeless slopes and among evergreen oak whose leathery leaves provide one of their main winter foods.

The Kashmir markhor survives in several small populations in eastern Afghanistan, in the Chitral, Dir, and Swat districts of Pakistan, and then again far to the south-east, in the Pir Panjal Range of India. Chitral was once famous for this markhor, and many small valleys such as the Drosh Gol contained 500 and more animals. Today most of these populations have been exterminated or reduced to tiny remnants. Exceptions are the Chitral Gol and Tushi, both private reserves belonging to the royal family of Chitral, each of which contain about 125 markhor. Probably fewer than 1,500 Kashmir markhor remain in the western part of their range; of these perhaps a third occur in Chitral.

Astor markhor frequent the scattered cliffs bordering the Indus and its tributaries. The new roads along all the major valleys have opened up once remote terrain to motorised hunters who can now shoot markhor with ease when the animals descend to their winter ranges, and their decline has been drastic, whole populations having disappeared along the upper Gilgit River. Several years ago Roberts estimated "not less than 500 to 600" markhor in the Kargah Valley; today only about 50 survive. I cannot estimate the number of Astor markhor, but would guess that they are still at least twice as abundant as the Kashmir markhor.

Ibex

Markhor

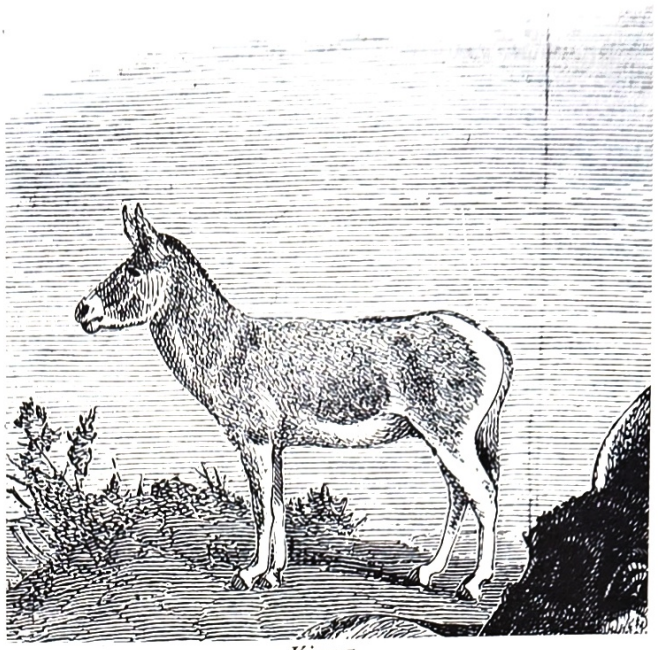
Asiatic Ibex. The ibex *(Capra ibex sibirica)* is the most widespread and abundant wild ungulate in the mountains. Essentially confined to the alpine zone between 3,500 and 5,000 m., the animals have been able, by virtue of their habitat, to elude the casual shooter. Yet densities are generally low, partly due to the fragmented habitat, the tiny cases of green hidden in the haggard waste of rock and snow, and partly to persistent persecution by meat hunters. In the valleys around Kilik Pass in Hunza, where a local military unit had shot at least 60 in the winter of 1972 – 73, I tallied only 59 ibex, about 0.4 animals per sq. km. Around the Dorah Pass area of Chitral, once famous for ibex, a week-long search revealed only 10 animals in 50 sq. km. However, in the privately protected Besti region of Chitral, 72 ibex were found in 40 sq. km. Not included in such tallies are the vast expanses of sterile uplands which are almost devoid of wildlife. For example, along 30 km. of north-facing slopes along and near the Baltoro glacier 40 ibex were spotted. At that season perhaps only 100 animals existed there in at least 1,400 sq. km. of glaciers and bare cliffs. By way of contrast, in the eastern Pamir, Heptner et al. reported 600 ibex in 100 sq. km.

Shapu. Like all urials, the shapu or Ladak urial *(Ovis orientalis vignei)* prefers rolling but not precipitous terrain at low altitudes. This sheep penetrated the mountains by following major rivers, as the markhor did. In 1841 Blyth wrote, "Vast numbers of this species are driven down by the snow in winter

to the branches of the Indus, near Astor." Unfortunately man and his livestock have usurped most shapu habitat, and downstream of Skardu the species is now virtually extinct. The sighting of a shapu in Chitral is today a noteworthy event, whereas even 40 years ago they are said to have numbered thousands. Small populations persist in the Shigar Valley north of Skardu, as well as in the Braldo valley, where I saw 38 sheep at 3,400 m. near the Baltoro glacier; along the Indus and Shyok, too, are some survivors. On the whole, however, the status of this subspecies is critical. Fewer than 1,000 animals in small vulnerable populations are left in the country.

Marco Polo Sheep. *Ovis ammon polii* is one of the most coveted trophies because of its huge horns. Its range in Pakistan consists of only some 55 sq. km. of rolling terrain above 4,500 m. around the Kilik and Khunjerab passes in northern Hunza. This limited habitat, coupled with extensive hunting, has made it one of the rarest animals in the country. At one time *polii* flocked into Pakistan from the Tagdumbash Pamir in Sinkiang Province because the Khirgiz tribesmen there hunted the animals with dogs, whereas the ruler of Hunza protected them. As recently as November 1959, a well known western hunter saw a herd of 65 rams at Khunjerab Pass, and is said to have shot at least five, an action which presaged the fate of the species there. The construction in the late 1960s of the Karakoram Highway, linking Pakistan with China via the Khunjerab Pass, almost doomed the sheep. In 1968, one military officer shot fifty for meat, and the possession of Marco Polo sheep trophies became a status symbol in Pakistani homes, just as a tigerskin rug once was in India. Fortunately China has protected the species for over twenty years and provided the survivors from Pakistan with a safe haven. At present the Marco Polo sheep is only a sporadic visitor to the Kilik and Khunjerab passes; there was not a single animal there when I visited the areas in November 1974.

Marco Polo Sheep



Kiang

Bharal and Kiang. The Shimshal Pass in northeastern Hunza, which I did not visit, is the home of these two species which are found nowhere else in Pakistan. For the bharal *(Pseudois nayaur)* a goat, this represents the most westerly extension of its range, but I do not know how abundant it is; judging by Shipton's account, the heards are readily seen. Villagers told me that the kiang or Tibetan wild ass *(Equus kiang)* is an occasional visitor to the upper Shimshal Valley.

Snow leopard. *Panthera uncia* is exceedingly rare throughout the high ranges. With wildlife so scarce, the cats must either travel far in search of prey or subsist on domestic stock, the latter habit guaranteeing them a short life expectancy. I made intensive surveys only in Chitral, although I saw tracks at Kilik Pass and along the Baltoro glacier. In December 1970, I saw two snow leopards in the Chitral Gol reserve and the tracks of a third. Their food at that time consisted mainly of domestic goats and sheep (found in 50 per cent of the droppings), markhor (in 31 per cent) and *Rheum* forbs (in 13 per cent). At least six snow leopards were shot in the vicinity of the reserve in the winter of 1971-72. The following winter two visited the Chitral Gol briefly, and at least one was shot nearby that year. In the 1973-74 and 1974-75 winters no snow leopards came to the reserve. In February 1974, I censused snow leopards in about 300 sq. km. of Chitral and found evidence of four or possibly five individuals. Within four years the status of the snow leopard there had changed from tenuous security to seriously threatened, and it is not just coincidence that the decline occurred during a political and legal inter-regnum, when the semi-autonomous state of Chitral was absorbed into the North-West Frontier Province. One estimate places the number of snow leopards in Pakistan at about 100. I cannot provide a precise figure, but feel sure that fewer than 250 survive in the country.

Brown bear. *Ursus arctos* is readily seen in Pakistan as dancing bears on the streets of Lahore and Peshawar. Gypsies and other itinerant entertainers provide a ready market for cubs captured by herdsmen in the mountains after shooting the mother.

The brown bear's status is even more critical than that of the snow leopard. It is virtually extinct in the 11,250 sq. km. Chitral district, the only spoor I saw there was near the Karambar Pass and it is equally scarce in most other ranges. At Kunjerab Pass a bear had excavated a burrow in pursuit of marmots, and the droppings of one or more bears near the Baltoro glacier showed that the animals lived on grass (in 69 per cent of the droppings), roots (in 34 per cent), and ibex killed by avalanches (in 16 per cent). I mention these trivial observations to show that the finding of occasional bear spoor is a notable event. The last stronghold of the species in Pakistan may be on the Deosai Plains southwest of Skardu, but no survey has been made there yet.

Wolf. *Canis lupus*, though uncommon, is periodically obtrusive, for wolves may sweep close to a village, kill a domestic goat or two, bolt some meat, and vanish as suddenly as they arrived. I encountered them only twice. On one occasion in the Chitral Gol, two wolves chased nine markhor unsuccessfully, and on another two wolves followed an ibex trail at 4,800 m. near Kilik Pass. An analysis of 63 sets of droppings in the northern area revealed their opportunistic diet: domestic stock (in 38 per cent), ibex (37 per cent), marmot (17 per cent), and shapu, Marco Polo sheep, hare, and grass (2 per cent each).

Conservation. Although many mountain slopes have been denuded, their forests felled and the ground cover devastated by livestock, such degraded habitat could nevertheless support more wildlife than it does now. Several small surviving populations of wild sheep and goats are reproducing adequately, and the markhor are even giving birth to twins quite commonly. With natural predators scarce, these populations could be expected to increase – if poaching were fully controlled.

Legislation for the proper protection of wildlife exists now in most areas. In 1973, the Deputy Commissioner of Chitral prohibited the shooting of large mammals, and in the same year hunting was banned in the Gilgit Agency by the Central Government. This had a dramatic effect. Within a year everyone knew of (though did not necessarily honour) the new restrictions. In the mountains the time-honored slogan, "If it moves, shoot it; if it doesn't, chop it down", is still practised with some vigour. But in the government a new awareness of wildlife conservation now permeates all levels, partly stimulated by the realisation that a herd of Marco Polo sheep or a snow leopard on a kill make unique tourist attractions. Sanctuaries have been officially designated, among them the Chitral Gol, and national park status has been proposed for Nanga Parbat and for K2, at 8,611 m. the second highest peak in the world. A most significant conservation step was the establishment on 29 April 1975 of Khunjerab National Park in northern Hunza, by order of Prime Minister Zulfikar Ali Bhutto. Covering 2,200 sq. km. and with no permanent human habitation, this park protects both Marco Polo sheep and bharal. These and other steps augur well for at least some wildlife and its habitat, though several species, such as the shapu, are still not adequately protected in reserves.

The mountains will retain their beauty without the animals, but when the last brown bear has disappeared from the alpine meadows and the last snow leopard from the crags, a spark of life will have gone too, turning the peaks into stones of silence.

Brown Bear

REFERENCES

Anon, 1972. **The snow leopard in Pakistan.** Animals, 14(6): 256-259.

Burrard, G. 1925. **Big game hunting in the Himalayas and Tibet.** London.

Heptner, V., Nasimovic, A. and Bannikov, A. 1966. **Die Säugetiere der Sowjetunion.** Jena.

Mountfort, G. 1969. **The vanishing jungle.** Collins, London.

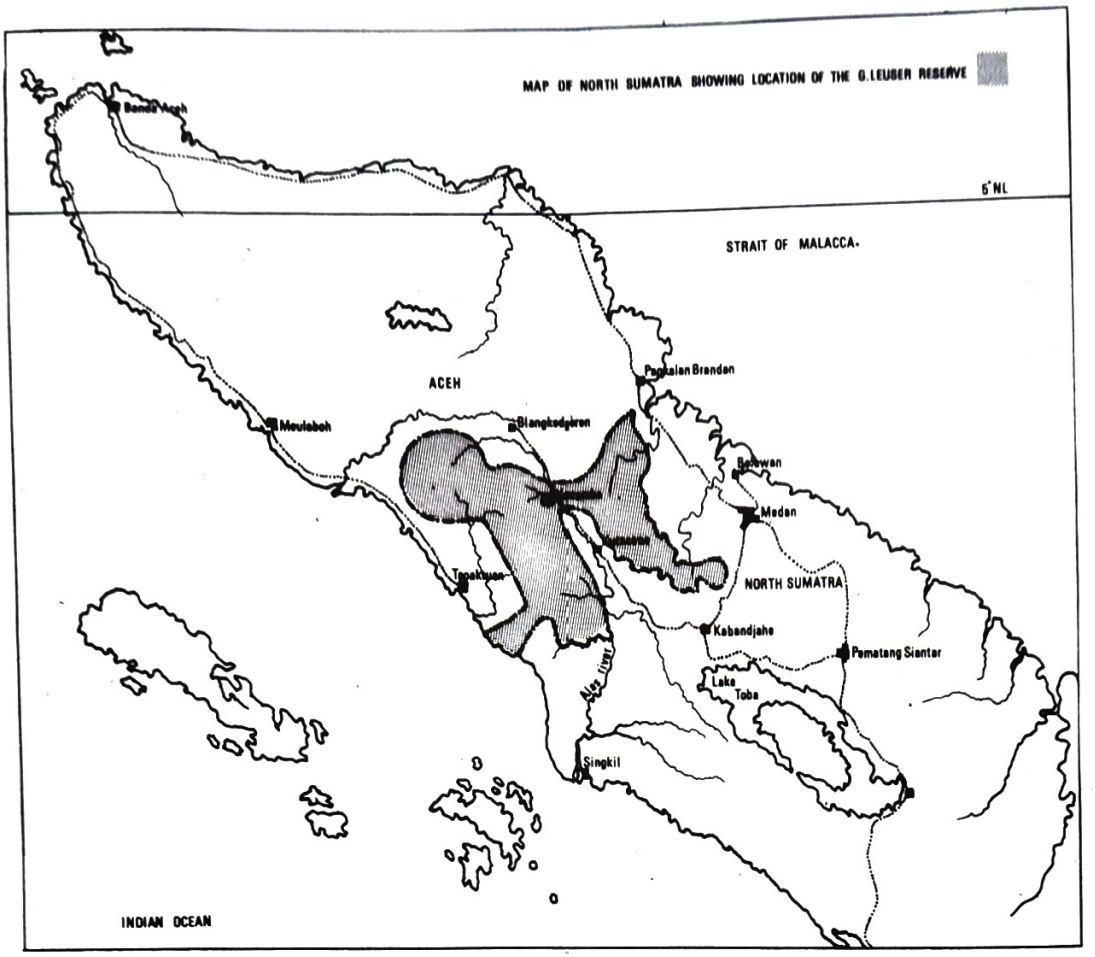
Roberts, T. 1969. **A note on** *Capra falconeri* (Wagner, 1839). Z. f. Säugetierkunde. 34(4): 238-249.

Schaller, G. and Khan, A. 1975. **Distribution and status of markhor** *(Capra falconeri).* Biol. Cons. in press.

Shipton, E. 1938. **Blank on the map.** London.

Stockley, C. 1936. **Stalking in the Himalayas and Northern India.** London.

from: **Oryx,** *July 1976.*



THE GUNUNG LEUSER RESERVE

by Nico J. van Strien

The Gunung Leuser Reserve, actually a group of adjoining reserves, is one of the largest in this part of the world and one of the main "strongholds" of S.E. Asian fauna and flora. More than 6,000 square kilometers of the Sumatran mountains, the Bukit Barissan, are included. Roughly the Reserve covers a stretch of almost 100 km. of the mountain range, just west of the city of Medan. Unfortunately it is almost split in two by the overpopulated valley of the Alas river.

Although the Leuser Reserve can not be called untouched, it still is an area of major conservational importance, and of great scenic beauty. It harbours one of the last thriving groups of the Sumatran rhino together with elephant, tiger, clouded leopard, bear, orang utan, siamang, mountain goat, and many other less conspicuous species. Until now, none of the original elements of the Sumatran mountain fauna and flora have disappeared from the area – which is a rather unique situation. But there are some serious threats, which if unaverted, will bring irreparable damage to the Reserve and could strongly reduce its value in the next few years.

First of all, one should be well aware of the natural structure of the landscape, flora, and fauna of this area. The Leuser Reserve is a mountain and not a lowland reserve. Only a small part (10 to 15 percent) lies below 1,000 meters altitude which is covered with tropical rain forest. The bulk of the Reserve is covered with mountain or high mountain forest. Although situated in the tropics, higher in the mountains the climate gradually becomes less tropical, and the fauna and flora become less abundant and varied. All the threatened animals are mainly restricted to the tropical zone or occur only in reduced numbers in the higher areas.

Above 2,000 meters, and there are many areas that high (Mount Leuser is the second highest mountain in Sumatra at 3,400 m.), the forest appears to be totally deserted. Birds are seldom seen or heard, butterflies and other insects are rareties; and only the orchids, pitcher plants, and rattans remind one of the proximity to the equator.

Therefore, it is false to claim that 6,000 square km. of tropical rain forest are protected in the Leuser Reserve. Only 1,000 square km. are real tropical rain forest and it is here that the wildlife is largely concentrated. So only a small part of the total area is of prime importance for wildlife, but this is also the commercially exploitable part and therefore heavily threatened at the moment. The process of stripping these areas of the Reserve has already started and is becoming a serious problem.

The first of the reserves was established in 1938. Later some more areas were added and some of the boundaries were marked in the field. However, the other reserve areas were largely left alone. The Leuser Reserve is one of the most remote and isolated areas in Sumatra and well away from urban areas. The mountains are steep, high, and mostly inaccessi-

ble. Large parts are still unmapped and have never been visited by man. Only scientists and rhino poachers venture into the interior, but all other activities are restricted to the lowlying fringes.

Until some years ago the remoteness and isolation created an effective form of protection against attacks on the reserved forests, but this has changed rapidly. The accelerating population growth has caused human activities to spread into the Reserve — particularly in the Alas valley, which is in the very heart of the Reserve. This process has continued rapidly and has already gravely affected the surrounding forests. In recent years many people have moved in from waste lands in the south and the virgin areas outside the Reserve were quickly logged and transformed into fields. Although the boundaries are marked in the field, they are not respected and deforestation continues inside the Reserve. First the wood cutters moved in, followed by other people, making fields on the stripped plots. Now fields occupy an area 1 to 2 km inside the Leuser Reserve and beyond this for about 4 km. trees are still being cut.

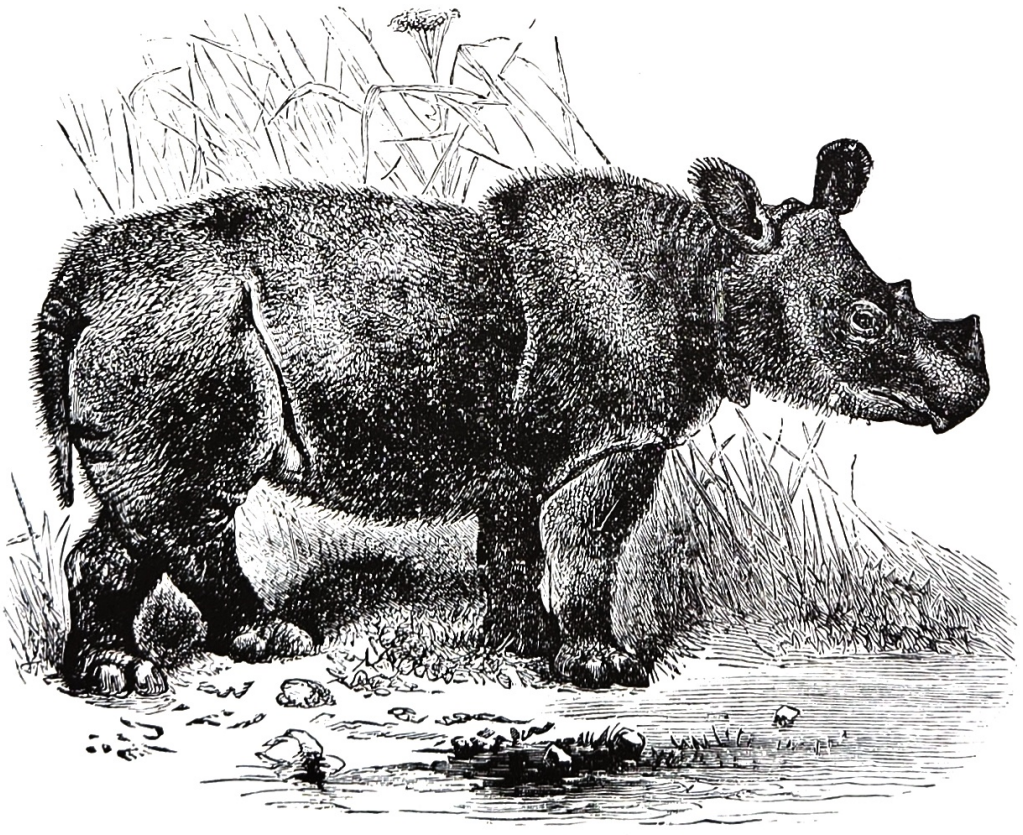
In many other areas this destruction is less extensive, but everywhere around the Reserve the pressure on the border areas is increasing. When people are not forced to respect the Reserve all important areas will be affected with a few decades and perhaps the Leuser Reserve will lose its value for the conservation of tropical nature.

Actually it is a socio-economic problem. Economic interests in logging are so great and pressure to spread the population so high, that people will not voluntarily respect the Reserve. From the conservation side it is well known that the squatters will not leave unless they are forced to do so. Only when conservation gets full support from all levels of government will the Nature Conservation Department be able to guard the Reserve effectively and make all other interests subordiante. At the moment commercial interests prevail and conservation is only supported when it does not interfere with these exploitative activities.

The fate of various animals largely depends on the future of their habitats. So, if the forests are preserved the animals living there will have a fair chance of surviving, but if the forests are destroyed it will be difficult to save most of the wildlife. Only a limited number of animals are able to live in a human influenced environment, thus most others will disappear along with the natural forests.

For a number of species some other factors are further limiting their chances for survival. These are the species which are closest to extinction (extaille) and need special attention.

For many years the Sumatran rhinoceros *(Dicerorhinus sumatrensis)* has been extaille and the situation presently looks pretty grim for them. The Gunung Leuser Reserve is one of the two or three places on earth where populations of this animal can still be found.



Sumatran Rhinoceros

Formerly they could be seen all over the Leuser area, but during the last ten years they have disappeared from all the border areas and only survive in small numbers in the almost inaccessible centre of the Reserve — above 1,000 meters. This is mainly caused by poaching, but also by increasing disturbance in the border areas by fishermen, farmers, and collectors of forest products.

The story of the rhino is a sad one. They have been removed from 99 percent of their former range by over 100 years of pursuit to supply the market with magical and stimulating concoctions (TIGERPAPER III:2, III:3). Already from the beginning of written history very strong healing and aphrodisiac powers were accredited to the rhino's horn and to the rest of its body. Although the belief was more widespread, the trade in rhino products was largely directed to the Chinese. Among them the belief in the powers of rhino horn is still strong and there is still a large demand for this product. With the decreasing numbers of rhino prices soared, but this didn't limit the demand. Rhino horn is still freely traded and available in many drug stores. Also around the Leuser Reserve there are agents willing to buy horns and often send out poachers to get what they want. Last year traps were found twice in the very centre of the Reserve, in which at least three animals were killed, and several times it was rumoured that elsewhere traps were also set. The remoteness and inaccessibility has long protected the rhino, but now that they have disappeared from other areas poachers are not hesitating to trek into the central area. The nature of the terrain makes effective anti-poaching patrol activities rather difficult. When the poachers are in the interior they are quite safe since it is practically impossible to patrol all the ridges and valleys.

The rhino population of the central area can still be called "reasonable" and an estimated 50 animals survive. Paths, wallows, and saltlicks are still regularly used and the finding of prints of a small calf proves that propagation is still going on. With regular patrols in certain strategic areas these animals can probably be saved for the future.

Elephants are not much better off than the rhinos, but their problems are somewhat different. Elephants are not very fond of steep gradients and their occurence is largely restricted to the lower and flatter areas, e.g. the southern and the northeastern parts of the Reserve. Elephants are great wanderers and in contrast to rhinos frequently leave the undisturbed primary forest to feed on the delicacies of the surrounding fields and plantations. Quite often elephants are reported to leave the Reserve and cause trouble to the local residents. In general, these people are too scared to guard their fields against the raiders with fires, noise, or other means and usually rush off to seek help from the police, or the military to shoot the animals. A too eager granting of these requests has resulted in many unnecessary killings. These ruthless killings, further encouraged by the value of ivory, have decimated the number of elephants.

The areas of the Reserve suitable for elephants are actually too small. On their extensive wanderings they invariably have to leave the protection of the Reserve and then run into trouble. Only when large tracts of lowland forest are added to the Reserve, e.g. the whole lower Alas valley, can the Reserve have sufficient space for these elephants.

Formerly elephants formed large herds, but this is a thing of the past. Now there remain only a few small groups, none of more than ten individuals, and a number of solitary wanderers.

The third species in need of special attention is the tiger. This huge carnivore still occurs all over the area, but its numbers are never high. They need vast territories to find enough prey. In most areas there is an ample supply of prey, but many tigers cannot resist the temptation of poorly guarded cattle. Now and then a tiger becomes specialised in stealing sheep, goats, and cows from the villagers. This inevitably results in the killing of the animal, and in recent years several tigers were shot around the Reserve. With increasing settlement close to the Reserve and increasing hunting of prey animals, tigers are forced to attack cattle for their food and then risk being shot. It is astonishing to see the kind of corrals the valuable cattle are kept — often in areas where tigers are still common. They are only built to keep the cattle in and not to keep tigers out. Much of the trouble is simply caused by neglect and when proper precautions are

Malayan Bear

taken, men and tiger can live quite peacefully together.

The last species to be mentioned here is the orang utan. This interesting animal, of which some thousands survive in the Leuser Reserve, is threatened by habitat destruction. They have a rather restricted range on Sumatra and are largely confined to the low-lying forests, and are not likely to adapt to disturbed areas.

The catching of orang utan babies for the pet trade has decreased in recent years, thanks to the active confiscation of these animals by wildlife authorities. But still, the two orang utan rehabilitation stations in Sumatra, are receiving freshly caught animals and an orang utan as a pet is still fashionable (TIGERPAPER III:1).

Apart from these four animals there are many more species finding a refuge in the Leuser Reserve. Next to the orang utan there are siamang and the white-handed gibbon in addition to leaf-monkeys, crab-eating and pig-tailed macaques. Among the carnivores the clouded leopard, the Malayan bear, and the mysterious red dog have to be mentioned. Then there are barking deer, wild boar, mountain goat, and many other smaller species.

The author is a biologist who is collecting data on the occurrence of large mammals, in particular the Sumatran rhinoceros, in the Leuser Reserve. His address is:

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THE ECOLOGICAL EFFECTS OF LAND DEVELOPMENT

by Lee Kam Wing

Throughout history land has been the most sought after and yet one of the least understood of the earth's phenomena. Nearly always it has been regarded as wealth and something to satisfy a demand for food or living space. Rarely has it been treated both as a living entity and a resource in very limited supply. The term land includes soil and topography, in fact, all the physical features of a given location. It reflects the interactions of physical conditions, natural processes, and man's response to them in social and economic situations which dictates the planning and use of land.

The use and misuse of land cannot be overstressed since land development for agriculture, forestry, and mining forms the key elements of the economic development of most developing countries. Developing countries which have abundant land and natural resources, together with a favourable climate constitute a valuable heritage and potential for economic growth and progress.

Land administration is a highly complex matter with many varied interests as well as socio-political overtones. For efficient and ecologically sound use of land, a balanced and progressive land-use policy must be adopted by developing countries which intend to embark on large-scale land development schemes.

During the past decade, a number of developing countries including Malaysia have increasingly emphasised the importance of the role of land development within the context of their national development programmes. In West Malaysia, a dramatic removal of the forest will occur as regional development schemes such as Pahang Tenngera and other state schemes are implemented. Considering the number of areas or projects to be developed by as many as 15 different agencies, sufficient coordination and cooperation among all the various implementing agencies and the technical departments regarding the need for a planned and controlled forest clearance is clearly needed.

WATER BALANCE, MICROCLIMATE, AND NUTRIENTS

The plant-soil system of a forest involves an almost closed cycling of nutrients associated with a characteristic pattern of water use. Typically it has complex microclimatic relationships which are very distinct from the changes in the surrounding macroclimate, and its high rate of energy use is expressed in a very high rate of litter production, rapid mineralization rates, and a rapid attainment of equilibrium with respect to organic matter relationships. Further, the plant-soil system is strongly buffered against changes in atmospheric conditions, especially with relation to variability in water supply, air currents, and changing humidity. The effect of seasonality is thereby much reduced and to a considerable degree the system tends to maintain the conditions it requires for its persistence, both in space and time.

Water movement is the vehicle by means of which nutrients are cycled in the plant-soil system. Under the forest is an almost closed nutrient cycle, with little loss to groundwater, and negligible losses in surface and near surface lateral movements. Thus under a forest cover, the plant-soil system is an extremely complex, resilient and stable ecological entity, strongly buffered against change induced by

Dynamics of devastation, photo Milton

environmental effects notably the seasonal and diurnal climatic changes. However, large scale land development schemes involving the removal of thousands of acres of forest usually prove too much for nature's ecological defense set-up, with the consequense of such adverse effects as soil erosion, siltation, and flooding.

Land development for agricultural practices breaks up the cycles of water and nutrients and destroys the structure upon which microclimate distinctiveness depends. Nevertheless, under normal shifting cultivation practices, the disturbance is of short duration and limited extent, being restricted to small discrete patches, and lasting only for three or four years. However, removal of large tracts of land for plantation purposes disturbs the balance in a greater way and there is greater decline of nutrient levels. The generally shallower rooting system of these trees had a significant effect on water relationships. The nutrient effect may be serious, especially under conditions of efficient and high-level production such as may be achieved on some commercial plantations.

Consideration of pest and disease problems reveals complex patterns of ecological relationships. These may frequently be traced back to the reduction of the complexity of the forest ecosystem which is the inevitable consequence of cultivation, or to the introduction of new microclimate or feeding relationships.

SOIL EROSION AND FLOODING

Forest clearance, more often than not, is carried out in hilly and mountainous areas. Under heavy rainfall conditions, geologic erosion takes place at a relatively high rate even under a thick forest cover. This is evidenced by muddiness of tropical rivers and the large amounts of suspended matter they deposit in a flood. When the forest cover is removed and not replaced by an equally effective cover the erosive action of rains is accentuated considerably and sheet flow tends to be encouraged. Heavy rain will strike the ground surface with increased energy and reach the water courses quicker and in greater quantities. Flash floods with intervening periods of abnormally low water levels will be more common.

The product of erosion in the upper reaches of a river is two fold, viz it forms a buoyant load of fine clay in suspension, which once emulsified nearly never settles out again, and the heavier load of gritty sand and finely broken rock. As this load moves downstream, by an action of attrition on the river bed and banks, it increases the volume. Once the stream achieves the consistency of a sloppy concrete mix it can buoy up pieces of solid rock which would normally not be moved by a similar force of clear water. As the river flow slows down at the plains, these sediments are deposited on the river bed, resulting in a reduction in the channel capacity, which in turn increases the severity of subsequent floods even with the same amount of flood water.

In West Malaysia, recent floods have served to indicate that large-scale land development is beginning to take its toll. Increased severity and frequency of the recent floods follow closely the large-scale land development schemes for agriculture, housing and industries. Stretches of the tributaries of Perak River north of Grik are now buried in sediment, and shifting tobacco cultivation near Lenggong, Perak has caused serious sheet and gulley erosion and is pouring tons of silt into the Perak River. The silt load in the Sungei Semarak in Kelatan, coming down a mountain tributary whose catchment has been cleared, has been serious enough to warrant dredging operations to prevent the blocking up of the main river and flooding of an important rice area.

Land development is not only implemented for agricultural purposes, but also for industry and housing. The need for industrial development and the spatial expansion of urbanization can obliterate much of the forest vegetation such that interception can result in high sediment loads and increased flood

flow. During the constructional phase, relatively large areas of land are frequently cleared of vegetation, and all slopes are reduced to a minimum by extensive earth moving operations. Thus the top-soil is removed possibly to a valley either far away or nearby. A loss of the top-soil is hazardous since the sub-soil is much easier to erode than the surface soil. The structure is very weak and hence splash erosion has no difficulty in forming the slurry which quickly finds its way into the drainage systems of the new factory or housing complex, and from there to block up nearby rivers. Further, the removal of earth to valleys to form flat areas is a bad practice as the blocking up of a valley which is the natural water pathway of that area may lead to another form of soil erosion which is even more dramatic – land slide.

EFFECTS ON THE FAUNA

In a developed forest the fauna is rich and diverse as a result of the complexities of food niches and microclimates induced by the structure of the vegetation. This diversity is displayed by mammals, birds, reptiles, and insects. Land development may produce some adverse effects on the fauna. Certain species could be severely depleted by their exploitation just before the forest is cleared. Other species, e.g. snakes would be destroyed because of their apparent danger to humans and domestic animals. Feeding niches for many species are reduced in number, while man himself provides an increase of host or reservoir organisms for various parasites causing diseases. The former often results in the concentration of feeding on crop plants and has a consequent pest problem. In Malaysia, removal of large tracts of forests has driven scores of large "protected" animals like elephants and tigers to new land settlements close-by where they create a nuisance of themselves by destroying large areas of croplands. Land

Clear cutting of virgin forests results in. . .

. . . the depletion of the soil, photo Unasylva

settlers treat them as pests and most are shot mercilessly. The latter produces fundamental changes in disease pattern as in Malaysia where land clearance could greatly increase the breeding sites (and thus enhance the risk of malaria) of the malaria vector, *Anopheles maculatus.*

LAND ETHICS

From the above discussion we should now recognize that land together with its soil and trees are natural resources vital to all life on earth. To appreciate their full significance requires more, however, than an understanding of their part in the energy circle, more than a detailed scientific knowledge of their constituents and how to conserve them. It requires what has been called a land ethic.

Land as a community is a basic concept of ecology, but that land is to be loved and respected, is an extension of ethics. A land ethic, then, reflects the existence of an ecological conscience, and this in turn reflects a conviction of individual responsibility for the health of the land. Health is the capacity of the land for self renewal. Conservation is our effort to understand and preserve this capacity. We must examine each question in terms of what is ethically and aesthetically right, as well as economically expedient. A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends otherwise.

If such an awareness of the deeper relationship of man and the land were to become widely diffused throughout the community, it would do much to create and maintain the high quality environment that man so desires.

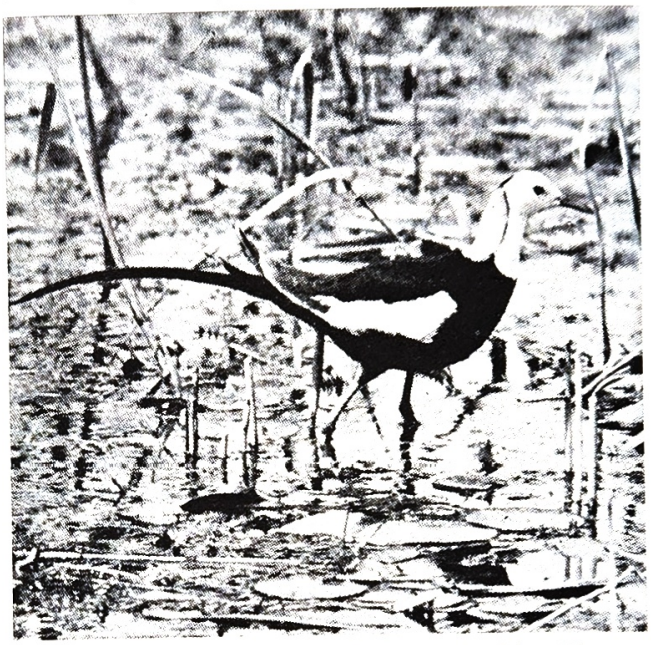
from: **Taraxacum** *10:3/3*

TALAY NOI RESERVE

Talay Noi, situated in the junction of Pattalung, Nakorn Si Tammarat, and Songkla Provinces, Thailand, was declared a Waterfowl Reserve area in early 1975. It is a component of the Songkla Lake lagoonal basin and has a total area of approximately 50 square kilometers. The office is in the village of Talay Noi and can be reached by bus or private car from Pattalung City; it may also be reached by boat from Ranot in Songkla Province.

Talay Noi is a rich habitat for resident and migratory bird species. Six habitats are available to waterfowl in the area. The open water section of the lake is characterised by the lack of floating vegetation. The lake is shallow – usually between 1 and 2 meters deep. This zone is infrequently used by waterfowl except as a resting area by migratory species such as Cotton Teal (*Nettapus coromandelianus),* Little Grebe *(Podiceps ruficollis),* and Little Cormorant *(Phalacrocorax niger).* An *Eleocharis* emergent zone is found in and around the lake. The amount of area available to waterfowl in this zone is dependent on flood conditions. Common inhabitants in this area includes Purple Heron *(Ardea purpurea),* Purple Gallinule *(Porphyrio porphyrio),* and Whistling Teal *(Dendrocygna javanica).* The *Melaleuca* forest zone is mostly situated north of the lake. This area has not been extensively surveyed and there is a possibility that there are remnant populations of Giant Ibis *(Pseudibis gigantea)* and White-winged Wood Ducks *(Cairina scutulata)* still found there. Purple Herons are also known to nest there. Rice paddies are used as feeding areas during times of flooding by egrets and herons and during dry periods by Spotted-necked Doves *(Streptopelia chinensis)* and Collared Pratincole *(Glarea pratincola).* During dry periods the wet meadows are exposed. These areas are believed to have been former *Melaleuca* forests. In these areas shore birds, herons, and egrets can be found. The zone of *Nymphoides, Nymphea,* and other floating aquatic species can be found in the lake and in pools in the *Melaleuca* forest. This zone is the preferred habitat of such species as Bronze-winged Jacana *(Metopidius indicus),* Pheasant-tailed Jacana *(Hydrophasianus chirurgus)* and Cotton Teal *(Nettapus coromandelianus).*

During my 6 month survey conducted from October 1975 to March 1976, a total of 45 species of waterfowl and other species thought to be important to the area were tallied. A research paper has been written and has been submitted to Dr. Tem Smitinand, editor of **The Natural History Bulletin of the Siam Society.**



Pheasant-tailed Jacana, photo Loke Wan-Tho

Unfortunately, since Talay Noi is a reserve area rather than a wildlife sanctuary, exploitative pursuits are still allowed. Fishing practices such as the use of gasoline powered generators to electrocute fish are common. Grazing and indiscriminate burning of fields reduces the quantity and quality of nesting habitat for waterfowl. The *Melaleuca* forest is being cut down to produce charcoal. This forest provides a major part of the region's fuel supply. Since the space in the reserve area is finite, the establishment of new rice fields must also be regulated.

Talay Noi is a unique area in the Malay Peninsula and is well worth preserving as a waterfowl reserve area. If the area is to remain as valuable in the future, more protection must be given now.

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The author, an American Peace Corps volunteer, is a wildlife biologist and has worked in several sanctuaries in peninsular Thailand under the auspices of the Wildlife Conservation Division, Royal Forest Department.

Bronze-winged Jacana

SECOND EXPEDITION TO THE DONGRAK MOUNTAINS

As we indicated in TIGERPAPER III:2 there would be another expedition to the Dongrak mountain range in north-eastern Thailand in search of kouprey *(Bos sauveli)* during the monsoon this year. The expedition was carried out from 13 to 21 August 1976 in a joint effort by FAO and the Wildlife Conservation Division of the Royal Forest Department.

From information collected during the first expedition (TIGERPAPER III:2) it was expected that kouprey would visit the Dongrak mountains, coming from the northern plains of Cambodia, during the monsoon months. During the second expedition a local hunter, who was on the first trip, acted as guide. He and other hunters we met in the area had seen kouprey during the monsoon of 1975.

Although we searched the area for several days, we did not find any evidence of kouprey in the mountains — not even foot prints. This correlated with the observations of the local hunters we encountered since none of them had seen any kouprey in 1976.

In explaining the absence of kouprey we made the following notes:

In 1975 a lumber road was completed from Kantaralak to Top Saphan Hin and since then many disruptive changes have occurred in the area. The uncontrolled influx of settlers, hunters, and collectors of forests products easily made their way into the mountains. Where until recently the Dongrak forest remained relatively undisturbed, now vast tapioca and maize fields are common, and large bands of hunters, collectors, as well as timber trucks move up and down the road. Due to the removal of the valuable canopy species, the remaining forest is changing its evergreen character towards a deciduous facies.

During our week-long stay in the area, shooting was heard both during the day and at night at an alarming frequency. We personally encountered 28 different hunters in the area during our stay there, but many more must have been present. Some of the hunters were equipped with military firearms, such as M.1's and M.2's, and carried flashlights, but most hunters were equipped with traditional muzzel-loaders and had their dogs trailing closely behind.

Since most of the game had been either shot or driven from the area, the hunters occupied themselves between shots with the collection of orchids, ferns, and other valuable plants. This guaranteed a high hunter presence even though there was little game to shoot— at least during the day.

Due to the lack of big game the hunters also concentrated on smaller game and birds. The only report of big game came from a hunter who claimed that he had shot a gaur in June this year.

Some of the animals encountered, either by signs or through direct sightings, during our survey were:

Pileated gibbon *(Hylobates pileatus)*, heard calling during mornings on several occasions and seen in the evergreen canopy below the escarpment in Cambodia.

Crab-eating macaque *(Macaca fascicularis)*, one troop of some twenty animals, adults and young, seen leaving their night roost on the vertical rock cliffs on the escarpment in Cambodia.

Sambar deer *(Cervus unicolor)*, two animals seen and tracks found, probably very common in the past, but now declining due to heavy hunting pressure.

Barking deer *(Muntiacus muntjac)*, a few tracks found, probably fairly common but heavily hunted, particularly at night with the aid of flashlights.

Wild boar *(Sus scrofa)*, a few tracks and "ploughed" areas found, probably fairly common due to their ability to withstand heavy hunting pressure.

Elephant *(Elephas maximus)*, what must have been elephant was seen pushing its way through thick stands of bamboo below the escarpment on the Cambodian side.

Porcupine *(Hystrix brachyura)*, quills found, probably fairly common.

Civets of unidentified species *(Viverridae)*, tracks and droppings were encountered fairly frequently.

Along the logging trail

On top of the Dongrak Plateau

In contrast to the survey in April, when tracks of banteng *(Bos javanicus)*, gaur *(Bos gaurus)* and kouprey were found, although they were not fresh and believed to be from the previous monsoon season, no tracks were found during this survey.

Reviewing the above notes one would consider the area to be hopeless for large herbivores in general and for kouprey in particular.

It is obvious that part of the range, especially on the Thai side, is already so far disturbed by logging operations and settlement that a reverse in trend is not possible; however, we still believe that there is enough potential left in the eastern part of the range to serve as a wildlife sanctuary, which possibly might even have kouprey among its game species.

The 5 – 10 km. wide Dongrak Range, which is composed of Jurassic sandstone and conglomerate of the Phu Phan and Phra Wihan Formations of the Korat Group, stretches approximately 200 km. in an east-west direction on the northern Cambodian border. The steep southern slope of the range actually forms a distinct geographical boundary between the two countries. On this side several waterfalls drop vertically down as far as 80 meters each. The range rises several hundred meters (maximum elevation 671 meters) from the flat country on both sides. The slope on the northern side is gradual, while the southern side has steep cliffs which offers a spectacular view of the forest in northern Cambodia. In the past, game has moved up from the southern plains through numerous passes to the top of the range where forage is abundant.

The area is quite varied ecologically and has three distinct vegetation zones which include numerous endemics and other interesting species.

Generally speaking, a deciduous forest is found in the lowland areas which have been disturbed by cutting the dry evergreen forest. As a result of removing the largest and most valuable trees from the evergreen forest, e.g. *Hopea* spp., *Dipterocarpus* spp., *Irvingia malayana*, etc. regrowth of the forest has been mostly of deciduous species. The deciduous forest begins a few kilometres south of the village Kone Ow and extends up to the northern escarpment to about 300 m. altitude. The deciduous forest is in various states of development – being almost completely secondary in composition to that of a double storied remnant of the original dry evergreen forest.

From about 300 metres the forest becomes more evergreen, more or less marking how far the logging operations have penetrated into the forest.

Above about 500 m. altitude up to the plateau the evergreen forest becomes less extensive and vast areas of dry dipterocarp and associated savannah are present. There are isolated patches of dry evergreen forest in several areas, however, where the sandstone bedrock is exposed only the savannah association has developed.

The southern escarpment of the Dongrak Range in Cambodia is evergreen and the adjacent plains are mostly deciduous with a few dry dipterocarp and savannah areas interspersed.

All environmental factors essential for kouprey as listed by Wharton (1957) are available here, with the possible exception of salt licks. However, patches of exposed red earth could be seen, just under the escarpment, possibly created by earth eating by animals, and well within reach of big game from the mountain range. The other environmental factors listed by Wharton are: natural open areas, refuge from predators, waterholes, and dense forest nearby for retreat during the hot hours of the day. Of these factors the refuge from predators has become the limiting factor since man became involved.

It is the plains area in northern Cambodia which is believed to be the last stronghold of kouprey, but no recent knowledge exists about its present status and security.

As far as we could observe from the Dongrak cliffs, the plains to the south seem to be almost uninhabited – only a few rice paddies were spotted in the far distance.

We believe this year the kouprey did not come for the first time due to the extreme pressures of man. Since we consider the eastern part of the range still suitable as kouprey habitat, we expect that if the range is set aside as a sanctuary before the monsoon season is over (this means before logging operations resume when the forest is dry), then a valuable area will be saved for the following reasons:

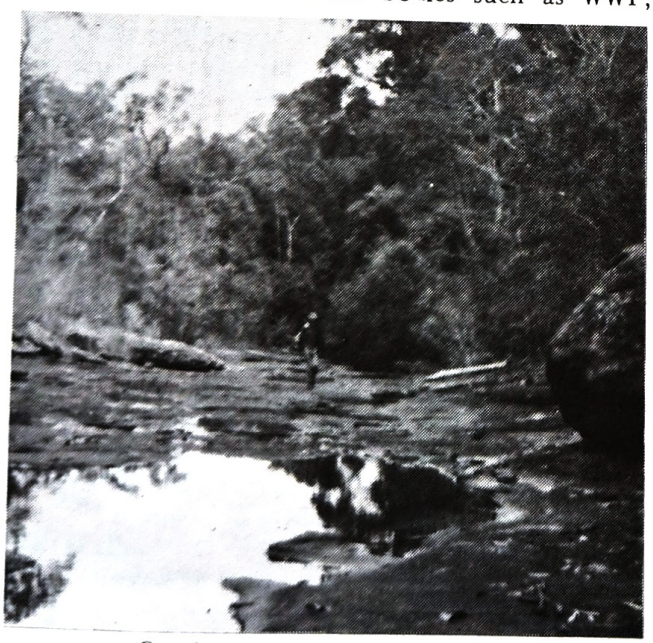
a) a good watershed area can be maintained which will be of benefit to the extensive rice production north of the range;
b) the flora, with its endemic and very interesting species, will be preserved; and
c) the fauna could re-establish itself with the re-appearance of species such as kouprey, gaur, and banteng.

Although each of these reasons on its own is important enough to set the Dongrak Range aside, it is in practice not that easy to effect – especially since private enterprise is involved, the pressure of settlers continuously increasing, and a lack of public support for conservation.

The reasons for the continuous deterioration of the area are timber and food production. However, the Dongrak Range will produce an insignificant amount of timber within the next two years, and after that there will be no timber production.

Food production will be the logial alternative, but here again the prospects are poor. After leaching and erosion, the soil is likely to become sub-marginal for this purpose, and after it has lost its nutrients, it is most likely to be abandoned completely.

The Royal Forest Department and its Wildlife and National Parks Divisions have shown their interest in the preservation of the area, but need the support of established international bodies such as WWF, IUCN, FAO, UNEP, and UNESCO to effectively preserve the Dongrak Range before it is too late. We hope quick action will be taken to save this area which has so little potential for sustained timber or food production, but so much for wildlife conservation and watershed (especially flood control) purposes.



On the northern slope, April 1976

Selected References on Kouprey

Bohlken, H. 1961 **Der Kouprey.** Zeitschrift für Säugetierkunde 26:4, 193 – 254.

Bohlken, H. 1963 **Bemerkungen zu drei Schädeln des Kouprey.** Zoologischer Anzeiger 171, 403-414.

Braestrup, F.W. 1960 **Kouprey-oksen, Opdaget 1933 – 1937 er det en slags urokse?** Naturens Verden, 37 – 44.

Coolidge, H.J. 1940 **The Indo-Chinese Forest Ox or Kouprey.** Mem. Mus. Comp. Zool. Harvard 54, 421 – 531.

Edmond-Blanc, F. 1947 **A Contribution to the Knowledge of the Cambodia Wild Ox or Kuproh.** J. Mamm. 28, 245 – 248.

Enderlein, P. and J.F. Maxwell. 1976 **A Preliminary Report from an Attempt to Find Evidence for the Presence of Kouprey** *(Bos sauveli)* **in Eastern Thailand and a Recommendation to the Government of Thailand to Set Aside the Dongrak Mountain Range for Conservation Purposes.** FAO, Bangkok, April 1976, mimeograph, 7 pp.

Enderlein, P. and J.F. Maxwell. 1976 **Report from the Second Expedition to the Dongrak Mountain Range in Eastern Thailand in Search for Kouprey** *(Bos sauveli).* FAO, Bangkok, August 1976, mimeograph, 14 pp.

Lekagul, B. 1952 **On the Trail of the Kouprey or Indo-Chinese Forest Ox.** Journal Bomb. Nat. Hist. Soc. 50:3, 623–628.

Lekagul, B. 1964 **Kouprey.** Cons. News SE Asia 4, 1 – 3.

Pfeffer, P. and Ou Kim-San. 1967 **Le Kouprey, Discussion Systematique et Statut Actuelle.** Mammalia, 31:4, 521 – 536.

Sauvel, R. 1942 **Le Kouprey ou Boeuf Gris du Cambodge.** Paris Soc. Nat. d'Acclimatation 3: 88 – 109.

Sauvel, R. 1942 **Distribution Geographique du Kouprey.** Mammalia 4:13, 144 – 148.

Urbain, A. 1937 **Le Kouprey ou Boeuf Gris Cambodgien.** Bull. Soc. Zoo. de France 62, 305–307.

Urbain, A. 1939 **Note Complementaire sur le Boeuf Sauvage du Cambodge,** *Bos sauveli* **Urb.** Bull. Mus. Nat. Hist. Nat. 11, 519 – 520.

Wharton, C.H. 1957 **An Ecological Study of the Kouprey** *(Novibos sauveli).* Inst. Sci. and Technology; Manila, Philippines, Monograph No. 5, 111 pp.

WILDLIFE EXPEDITION IN INDIA

The first scientific ornithological expedition to Ladakh in 50 years was recently undertaken by the Bombay Natural History Society and the World Wildlife Fund. The study team, led by Dr. Salim Ali, President B.N.H.S. and Vice Chairman I.B.W.L., sighted and studied the rare Black-necked or Tibetan crane *(Grus nigricollis)* in Ladakh and have made recommendations to the State Government and to the Prime Minister regarding protective measures that need to be taken to preserve the wildlife and natural areas of Ladakh. The study was financed entirely by the World Wildlife Fund. Other team members included: Dr. B. Biswas, Deputy Director Zoological Survey of India, Mr. Hussain and Mr. Vijayan, Research Assistants at the B.N.H.S. and Mr. Prakash Gole, Representative of WWF-India in Pune.

The Tibetan crane is one of the least known of the world's 15 species of cranes. It nests only at altitudes of about 13,000 ft. to 15,000 ft. and its restriction to geographically and politically inaccessible areas has, thus far, meant that detailed knowledge of the Tibetan crane is non-existent. The Tibetan crane is listed as a rare species in the International Union for Conservation of Nature and Natural Resources (IUCN) **Red Data Book.** Although the cranes were sighted by the WWF/BNHS expedition, there is no doubt that its status in India is very endangered.

Only 6 cranes were sighted by the team — 2 pairs, one single adult, and a chick. The first pair was spotted in the Chushul marshes. The nest of this pair was apparently disturbed and the eggs stolen. Despite this fact, the pair remained in the area and seemed reluctant to leave it. The movements of the pair in the area were noted and their calls were recorded.

The team met with success in Hanley (120 km south of Chushul) — where Dr. Salim Ali and his team spotted a pair of cranes with a chick. This is the first sighting of a Tibetan crane chick by ornithologists. The team was able to study the second nesting pair and its chick in detail. Various behaviour patterns such as diversion display, feigning injury, alarm calls, hiding their chick, etc., were recorded. The crane family was photographed from close quarters. This is perhaps the first time ever that a Black-necked crane family has been photographed in the wild. The team also received reports from the local inhabitants that there were 14 other crane pairs in the area, but no other cranes were sighted by the team.

It has been reported that the Black-necked or Tibetan crane is far more plentiful about 100 km beyond the Indian border in Tibet. Unfortunately, it has been virtually impossible to verify these reports and it is hoped that in the near future it will be possible to obtain information about these rare birds across the border.

About 190 Bar-headed geese (including chicks) were sighted at lakes Tso Kar and Tso Morari. Apparently Bar-headed geese breed earlier in the year and by the time the expedition reached Ladakh, the chicks were already out of their nests. During the expedition, other wildlife species sighted were the Tibetan wild ass or Kiang, marmots, diminuitive mouse hares, wolves, and Tibetan hares. It was not possible for the study team to ascertain the numbers of other large mammals in Ladakh as most of these had moved to higher altitudes and would come down lower only during the winter.

Black-necked Crane, photo Hussain

At the end of the expedition to Ladakh, Dr. Salim Ali met the Chief Minister of Jamnu & Kashmir, Sheikh Abdullah, and the J. & K. Minister for Ladakh, Shri Sonam Norboo, in Srinagar and the Prime Minister, Mrs. Indira Gandhi, in New Delhi. Dr. Salim Ali, together with Mr. Nalni Jayal, Joint Secretary for Wildlife and Forestry (who had toured Ladakh earlier) have made certain recommendations to the Prime Minister and Chief Minister. Among these were the following:

Creation of 1 National Park, 2 Sanctuaries, and a Zoological Park in Ladakh as follows:

a) A high altitude National Park in the Chang Thang area. This area contains the 2 lakes, Tso Kar and Tso Morari, which were reported to be breeding areas for the Tibetan crane and the Bar-headed goose. The varied landscape of the area also hosts a number of other Himalayan wildlife species including the Kiang or wild ass.

b) A sanctuary for the Himalayan Ibex, at Wakha, near Hanaskot.

c) A sanctuary for the Shapu and Bharal, near Shyok.

d) A Zoological Park at She for animals that have adapted to living at high altitudes.

from: **WWF-India,**
August 1976

WILDLIFE AND TOURISM IN INDIA

by Arjan Singh

Wildlife can only be saved by individual dedication and initiative. As you cannot tell me to love your dog, so it is not possible to instill a feeling for wildlife in a bureaucracy trained to serve political masters. The logistics of wildlife tourism in developing countries is that unless it can offer a substitute income for the nations involved, the local governments who need money for development schemes will not be able to afford the luxury of keeping something merely for its aesthetic value. Kenya has wildlife as its second biggest foreign exchange earner. Tiger Tops in Nepal is a valuable earner and a showpiece for that mountain Kingdom. Unless India does something similar, our parks are not going to last for aesthetic value alone. The wildlife entrepreneur will be repaid to keep his wildlife habitats and ensure that all these management and development measures dedicate themselves to the primacy of wildlife and the sanctity of the environment. In this we should not fail.

COMPENSATION

We have so degraded our forests by over utilisation, by excessive human and cattle intrusions, and by burning, that it is not enough to hope that the forests will recover on their own. We have degraded grasses by untimely fires and many wild ungulate populations suffer from fodder deficiencies. We have so decimated wild prey species through habitat destruction that predators are forced to subsist on an alien diet of domestic animals. For all this devastation we owe the ecosystem some recompense. The classic conception of national parks being secure against intrusion is not now sufficient. Over the years this concept has changed and now managers are needed for all facets of the ecosystem. Wild ungulates need an improvement of fodder grasses to accelerate their re-establishment, and the predators should have a sufficient supply of wild prey so that domestic animals and areas outside of the park are not threatened.

Every tourist knows India for its Taj Mahal and its tigers. They would resent it if the former was shaded from view. We should also try to make the latter a 'must' for the visitor. The original report of the Tiger Task Force sought to encourage tourism in project areas. This is now discouraged. What will happen when the project period ends? The answer lies in the progressive encouragement of private tourism in wildlife areas.

In that case we have to realise that uncontrolled tourism, which has a completely commercial bias, can be very harmful to wildlife interests. Boosting tourism by pure commercial operators might easily jeopardize the sanctuary involved and too many examples of this already exist! On the other hand, controlled wildlife oriented tourism can be of great benefit. Tourist operators must be good conservationists, as the conditions of the habitat and the prosperity of the wildlife are all interconnected, and the tourist will judge this condition on its merits, if suitably presented to him. Even then the system can be subject to abuse and over commercialization, but

Tiger at Dudhwa National Park, India; photo Arjan Singh

with good supervision and control this should be a minor detail.

The establishing of national parks is often considered by local people as a withdrawal of land which was one time their hunting or gathering area. Since these areas are suddenly taken away from them to serve other purposes, they have to find alternative ways of raising an income. From the conservation point of view it is essential to find ways so that people do not find themselves deprived of land, or in such a way that these people find another source of income. Because the integrity of the park boundaries is an essential part in the conservation of the area and its wildlife and plant species, the attitude of the people living along park borders is of great importance.

Therefore, the opportunities which are offered by tourism must benefit not only those who are involved in its set up, but also those who used to find a living in the preserved areas and who are still living nearby. They have to be incorporated in the tourism business, for instance as guides, general workers, or whatever labour is needed there.

These alternative ways of life must be so rewarded that people come to feel that the presence of wildlife is of direct benefit to them, so that the benefits of which they have been deprived in the interest of wildlife conservation are more than compensated for by jobs provided by the tourist industry. In other cases, for instance, the thatch and timber cutters who during their annual scavenging in the forest set fire to wildlife habitats, can be provided with concrete houses, and ease the pressure of an increasing human population on a diminishing forest. This presupposes a heavy expenditure which local governments in developing countries cannot afford, and if affluent nations are interested in saving wildlife in foreign countries where it is detrimental to human interests, they should share the cost.

INTERNATIONAL ISSUE

It is my confirmed opinion that wildlife conservation should be an international issue and should be accepted as such. Developing and poor nations cannot be expected to be enthusiastic about saving the tiger when there is the chance of the predator killing a man's only pair of cattle and landing him in the clutches of the money lender, or wild ungulates grazing his meagre crops and leaving his dependents to starve. Therefore, affluent nations, where most of their wildlife has been exterminated, which are now genuinely concerned about the survival of wildlife in other countries, must act as more than cheer leaders and should take an active part in financing conservation projects in nations where wildlife populations are rapidly dwindling.

The author is a well known Indian conservationist whose achievements include the creation of Dudhwa Sanctuary in Uttar Pradesh (**TIGERPAPER** *II:1) and a book entitled* **TIGER HAVEN** *(MacMillan. London, 1973). For further information write to Arjan Singh at:*

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VANISHING BIRDS IN INDIA

by Sumati

Birds play an important role in nature and each species has its ecological significance. Some, like the owl and the eagle, are wholly useful to man, feeding on unwanted things such as wastes and pests. Birds such as crows and sparrows are partly marauders and partly helpful.

There are some 1,200 species of birds in India. Today, several of these are struggling for existence.

Take, for example, the great Indian bustard, *Choriotis nigriceps*, which is almost on the brink of extinction. A large vulture-sized bird, it weighs around 15 kg (sometimes even 20 kg). It is found singly or in pairs or threes in the semi-desert regions of Gujarat and Rajasthan where it lives in scattered droves of 20 to 30 individuals. A shy and wary bird, the bustard keeps away from man, although it can be easily fooled when approached on a bullock cart, camel, or even a jeep. It is a good runner and also a good flier, though heavy in take-off. Once airborne, it can fly for several kilometres at a stretch but never at great heights.

The cock is polygynous. The hen lays one (rarely two) egg per clutch in a shallow depression at the base of a bush. Adults feed on locusts, grasshoppers, beetles, centipedes, small snakes, and lizards. They also raid fields, eat grains, and tender shoots of crop plants.

Why did the bustard population decline? Though protected by law, poaching is the main problem. The bird is quite easy to shoot as it can be approached on vehicles.

Peafowl

The tragopans of the Himalayan region are another endangered lot. There are four species: *Tragopan melanocephalus* (western horned pheasant), *T. satyra* (satyr tragopan), *T. blythi* (grey-bellied tragopan), and *T. temminckii* (Temminck's tragopan). They are found singly or in pairs and sometimes in small families in isolated places. Shy birds, they retreat into the thick undergrowth when threatened. They live on plant shoots, grass seeds, roots, insects, and insect larvae.

Of these, *Tragopan blythi* is on the verge of extinction because of mass snaring. Found in the forests of Nagaland, it is extremely difficult to spot as it always keeps to the thickest undergrowth. To save the bird from extinction, a breeding programme was started at the Kohima Zoo in early 1973, and after several attempts, the efforts were successful. There is a great demand for the bird and zoos the world over are willing to pay Rs. 10,000 for a pair.

Illegal snaring has also pushed quails and partridges to the endangered group. The birds are the gourmets' delight. Until the ban on killing them came in 1972, they were on the menus of many posh hotels. Poachers don't observe the close season and even take them during the breeding season. The black partridge, once common all over the Indian subcontinent, has also declined in number. The Haryana Government put a one year ban on its shooting in 1972, but what they overlooked was that the birds were not shot but snared. The mountain quail, *Ophrysia superciliosa*, a small, long-tailed, slaty-brown partridge with conspicuous red bill and feet, used to be found in and near the western Himalayas. It is now apparently extinct and even after a thorough combing of its habitat it hasn't been spotted since 1876. It probably ate grass seeds and insects.

Besides snaring, another reason for the decline of partridges and quails is probably the wide use of pesticides. Pesticides have affected their breeding behaviour and have also led to the thinning of their egg shells. They lay fewer eggs, which are more easily broken, or don't hatch. Also, deforestation and, therefore, destruction of habitat, is another important cause of their decline.

The pink-headed duck *(Rhodonessa caryophyllacea)* has not been spotted since 1933, and it isn't likely to be either. It was the size of a domestic duck, with a brownish-black plumage and a pink head. The female had a lighter, less demarcated pink head suffused with brown. Even in the last century, it had

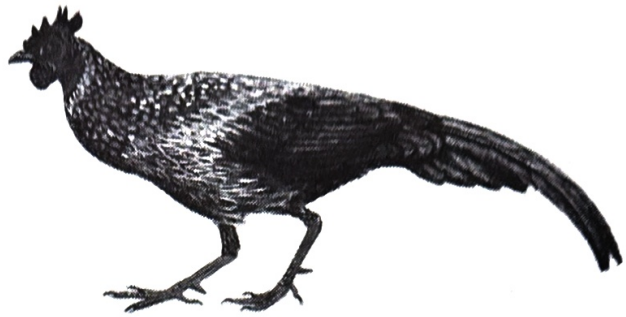
become quite rare and was found only in Bihar. An omnivorous bird, it was very secretive and hard to come by. Yet it was sought out from its hideout and killed for its flesh.

The white-winged wood duck *(Cairina scutalata)* inhabiting the Brahmaputra swamps and the flood plains of Assam, is also tottering on the brink of extinction. The bird is being bred in captivity in India and also in England and the United States with the purpose of reintroducing it to its natural habitat. It lives in water-logged depressions in dense forests, flying at dusk to feed in the open waters and returning to its haunt at daybreak. It is an omnivorous bird. The Zoological Survey of Calcutta attempted to study the white-winged wood duck in its natural habitat but had little luck. The team spotted just one pair of ducks for only five minutes and then the birds took off into the forest and disappeared. The same team also studied the problem faced by the large whistling teal – another endangered water bird. It lives in large, shallow, and muddy wetlands where water lilies, water hyacinth, and reeds abound. Their depletion was blamed on fowl catchers and also crows (crows rob and eat the eggs of the teal).

The white-eared duck *(Crossoptilon crossoptilon)* is found in the Arunachal area at heights of 3,000 to 5,000 m, rarely below 2,000 m. It is found in flocks of 5 to 10 birds in grassy clearings of rhododendron in the mornings and evenings. If left unmolested, it becomes extremely tame and friendly.

Wild ducks are prolific breeders. Some of them lay up to 18 eggs per clutch, though the norm is between 6 and 12 eggs. Because of the relentless

Jerdon's Courser



Grey Junglefowl

external pressure, their populations have now dropped very low. Firearms and reclamation of marshes for industry and agriculture have spelled their doom.

Another probably extinct (extaille) species is the Jerdon's courser, a bird closely related to the Indian courser. Jerdon's courser *(Cursorius bitorquatus)* was discovered in 1848 in small groups in the rocky undulating ground in the Pennar valley and the Godavari basin. It was last spotted in the region in 1900. It differed from the ordinary Indian courser in that it had loops around its neck.

The chir pheasant *(Catreus wallichi)* is found in the Himalayas from Hazara in Pakistan through Kashmir, Punjab, Himachal Pradesh, and the Kumaon area in UP. Living in groups of 5 or 6, the pheasants eat tubers, roots, seeds, and berries. Shooting and habitat depletion have reduced their numbers greatly.

The once common grey jungle fowl may succumb to another form of exploitation – the hackle feathers of this bird are used as fishing baits. Each hackle feather is said to fetch Rs. 11. Common 15 years ago, it is now rapidly declining because of the mass killing and export of hackles.

The national bird, peafowl *(Povo cristatus)*, is safe only in Gujarat and Rajasthan where it is left undisturbed. In the Karnataka and Maharashtra regions, its population is small. In the Chambal ravine, reclamation schemes seem to have upset its breeding.

Meanwhile, on the Nicobar Islands, the development of some previously uninhabited islands is pushing the two races of megapodes *(Megapodius freycinet nicobarensis* and *M. f. abbotti)* to extinction. The megapodes, though ground birds, are good fliers, but they prefer to run in the face of danger. They are found in pairs or large droves and are partly nocturnal. Close relatives of the pheasant and the jungle fowl, they live in the thick undergrowth. They lay their eggs just above the high tide level on the shore in a heap of vegetable matter and sand. The heap, containing up to 20 eggs (often of more than one bird), measures about 1.5 m. in height and 10 m. in circumference. The birds breed throughout the year and the eggs are incubated by the sun and/or by the heat of the decaying vegetable matter. They have vanished from many of the islands.

reprinted from: **Science Today,** *August 1976*

WILDLIFE IN THE LOWER MEKONG BASIN

The Mekong Project represents an international effort to develop the water resources of the lower Mekong basin for hydroelectric power, irrigation, fisheries, navigation, and flood control. The project is guided by the Committee for the Coordination of Investigations of the Lower Mekong Basin (Mekong Committee) which is assisted by the Mekong Secretariat, based in Bangkok and consists of an international group of experts covering a wide variety of disciplines.

Studies sponsored by the Mekong Committee in cooperation with authorities in the riparian countries have shown that the wildlife resource of the Mekong basin is still very rich indeed, with at least 212 species of mammals, 696 species of birds, and 213 species of reptiles and amphibians, for a total of 1121 species of land vertebrates. Of these, about 34 species are endemic, that is, they are found only within the Mekong basin or the basin plus a small adjoining area; these endemic forms are particularly important for conservation since they occur nowhere else and if they become extinct in the basin, they likely will be gone forever.

How will water resources development affect the basin wildlife? In the past, major water resources development projects have been thought to be tragically destructive for wildlife populations, but in the case of the Mekong basin, the contrary may be the case: the development of the Mekong River may be the single most important factor in saving the basin wildlife.

Firstly, there is no question that major water development projects will modify many riparian ecosystems and thus affect wildlife. But, if present trends continue without the building of dams, much wildlife will certainly become extinct anyway (as is already the case in many areas). Conversely, when wildlife conservation is recognized as an important part of river basin development, it can be included from the outset in a comprehensive development plan; for a very small proportion of the total cost of the project, a productive future role for the wildlife resource can be assured.

It has been shown that land use can be rationalized in conjunction with the construction of major dams by allowing the most productive lowlands to be used more intensively through irrigation, thereby reducing agricultural pressure on the more marginal land of the hills (where most wildlife live). In addition, dams can produce large blocks of marketable energy, sufficient to meet the needs of the region for decades, thus at least partially replacing consumption of both firewood and fossil fuels and permitting basic changes in land-use patterns. Agricultural development can be stabilized on the most productive land, while the marginal land, now being cleared of forest for transitory forms of agriculture, can revert to its most productive long-term uses: forestry, watershed protection, recreation, and wildlife conservation.

This approach to wildlife conservation has been more fully presented in an illustrated booklet called "Wildlife and the Mekong Project," available from:

Mekong Secretariat
Sala Santhitham
Bangkok, Thailand.

MARSUPIAL FRAUD OR FROG?

I recently received TIGERPAPER III:3 and would like to offer my encouragement for you to continue the good work. As a herpetologist I was especially interested in the claim that a new species of marsupial frog had been found in the Border Ranges National Park area. "Marsupial" is perhaps a poor choice of words since mammals have a monopoly on true marsupiums. There is at least one South American genus *(Gastrotheca)* that permanently retains a broad pouch on the back of the female. Two other genera *(Flectonotus* and *Cryptobatrachus)* exhibit a permanent set of more primitive folds and ridges on the female's back that act as a kind of bowl to retain the eggs until the young froglets or tadpoles emerge.

In still another group, the Surinam toads of the genus *Pipa,* the female develops a pit for each individual egg. These pits contain the egg, later the tadpole, and finally the young froglet until it emerges. The pits then degenerate.

There are also the midwife toads *(Alytes)* in which the males wind the egg strings around their legs until the eggs are ready to hatch; the mouth breeders such as Darwin's frog *(Rhinoderma)* in which the males retain the eggs in their vocal sacs; three genera *(Sooglossus* from the Seychelle islands, *Dendrobates* and *Phyllobates* from tropical America) in which the tadpoles firmly attach themselves to the male's back and are carried about out of the water until they drop off and complete their development in the water.

Of all of these species exhibiting specialized schemes of parental care only those of the genus *Gastrotheca* are considered "true marsupial frogs" *(fide* Mertens) by herpetologists. Whether the newly discovered species in Australia will be considered a marsupial frog or not awaits further information and research.

Will Way
Association for the Conservation of Wildlife
Bangkok, Thailand.

Orchid habitat in Borneo, photo E. F. de Vogel

TROPICAL ORCHIDS AS AN ENDANGERED PLANT GROUP

by E.F. de Vogel

"A dramatic offering of three new *Paphiopedilum* species from the remote jungles of central Viet Nam (Annam)....India....Philippines.

VIET NAM (ANNAM): The story of how our collectors managed to locate, collect and transport this rare species from the ravaged jungles of Viet Nam is still cloaked in total secrecy *Paphiopedilum anamensis (sic)*, well-established mature jungle plant $ 35.00.

INDIA: Collected in Nepal....this species has the identical leaf pattern of the very rare *Paphiopedilum wardii* (list price $ 500.00) and we feel that this could be a 'chance' rediscovery of this lost species.... $ 35.00.

PHILIPPINES: Collected on Guimaras Island, this is the first known collection from this remote Philippines area....*Paphiopedilum guimarasenses*, partially established jungle plant $ 35.00".

These are excerpts from a full-page advertisement of R.J. Rands Orchids, 15322 Mulholland Drive, Los Angeles, California 90024, in the **American Orchid Society Bulletin** p. 551 (June 1975). A dramatic offering indeed....especially for the orchids themselves!

Tropical orchids entered western European horticulture comparatively late, owing to transportation risks and inability to grow plants from seed. About 1800, Kew Gardens had a dozen species; another 12 were added in the next 15 years. From 1815-1840 a total of 53 species were added. Thereafter, accretion went faster when Wardian cases – a kind of mini-greenhouse which protected the plants from salt spray aboard ship – had been invented. Nurserymen – especially Cattley is to be named – grew more expert and aroused interest with the public. Before long a 'gold rush' on orchids was on and botanical gardens, firms, and amateurs employed collectors in the tropics. In 1836, Cuming regularly sent orchids from the Philippines; in 1843 Thomas Lobb entered the service of Messrs. Veitch and until 1860 collected in many places in Malesia. The hunt was not only for novelties since in 1870 Wallis was sent to the Philippines to ship *Phalaenopsis* in quantity. The profession held risks: eight collectors, among whom Klabach in Mexico and Wallis in Ecuador, lost their life in the service of Sander's alone. Collections often perished when a collector died or became ill and also in shipwreck or neglect on board.

European residents in the tropics also took interest and sent native tree climbers into the forest who took boatfulls of orchids – the desired species were kept and the rest thrown away. L. Coomans de Ruiter in his book **Uit Borneo's Wonderwereld** (1937) wrote that Gunung Kelam in West Borneo, about 1900 famous for its orchid flora, by 1935 was virtually depleted of orchids – the small-flowered species included. A Belgian firm ordered in Pontianak thousands of *Paphiopedilum lawrenceanum*. Local collectors who did not know this species, brought 3600 *P. hookeri* which were refused. An effort was made to sell them in the local market, but 3000 plants had to be discarded. Stations of other species in demand were tracked down and completely plundered. In 1929, Coomans de Ruiter proposed Gunung Kelam as an orchid reserve, but a few traders got wind of this and quickly organized a large collecting raid. The harvest arrived in such poor condition that it sold for a mere 20 dollars. Thereupon, Coomans de Ruiter

withdrew his proposal, "because nearly all orchids are now extinct in that area."

Nowadays, at the Puncak Pass on the highway between Bogor and Bandung, not far from the Cibodas Nature Reserve, many stalls offer wild orchids for sale. A network of plant exporters operates all over Indonesia. At Padang, I visited a "nursery" which was wholly stocked with wild orchids from the nearby forests. The owner explained that this was much more profitable than propagating the plants himself. When he received an order for species not in his region, he could get them from a colleague elsewhere. Not all his plants looked very healthy since species from the mountains were kept at the coast. His list carried 200 names, priced from 1 to 100 dollars, all American currency since he did not sell in Indonesia for lack of profit. He would take orders for hundreds of plants, but then you had to give him some time.

Botanical gardens, nowadays, do not collect for sale anymore, but Bogor, Singapore, and perhaps others, grow orchids artificially and also do their best to instruct nurserymen in these techniques.

The danger of extinction is often underrated by people who think that nurseries in Western countries will grow enough plants for the market. Yet we have here the Dramatic Offering before us, and in fact many species have already disappeared from the wild. In Holland, one grower proudly told me that one of his species was extinct in nature. Modern logging destroys huge tracts of primary forest, but commercial firms seldom take the opportunity to avail themselves during the logging operations of living plants, which are otherwise bound to perish.

Paphiopedilum victoria *Hk. f. from Borneo, photo E.F. de Vogel*

Close up of Paphiopedilum victoria *Hk. f., photo:E. F. de Vogel.*

When Coomans de Ruiter made his observations there was no law in Indonesia to regulate orchid export; the Sarawak one dates from 1929. There seems to be an ordinance now. But enforcement is a different matter. The Padang exporter told me that he never had any problems.

The parallels with threatened mammals, birds, and reptiles are only too clear, and the problems are identical. Protected species can be dispatched under the name of a common one; so bans must be imposed on whole groups of plants and animals. But once an international agreement is reached, like at the convention in Washington on trade in plants and animals in 1973 (which was signed by 57 countries), how can it be implemented against established commercial interests? Here again, conservation education will be peremptory.

Rijksherbarium
Schelpenkade 6
Leiden, Netherlands

from: **Flora Malesiana Bulletin** *29, (April 1976), abridged English version of a paper published in* **Panda Nieuws** *11:12 (December 1975), which is the monthly bulletin of WWF Netherlands Appeal.*

ED. NOTE

Although we are unaware of the status of wild orchids in other countries in the Asia-Pacific region, it is quite likely that commercial interests involving the exploitation of these and other plants, e.g. ferns, gesneraids, and other species with colorful flowers or unusual vegetative characteristics, flourish throughout the region.

At a S.E. Asian market numerous species of large epiphytic ferns, e.g. *Platycerium, Drynaria,* and *Asplenium nidus;* epiphytic vines with showy or fragrant flowers, e.g. *Hoya* and *Aeschynanthus;* and, of course, all kinds of orchids are openly sold. This market is also notorious for selling numerous animals including: otters, monkeys, gibbons, wild cats, hornbills, etc. – many of which are supposedly protected by law.

Many of the plants sold at this market, including all of those noted above, have been ruthlessly, and in many cases illegally, stripped from the forests. Indeed, it is quite common to find large specimens of *Dendrobium, Cleisostoma, Cymbidium* and other large epiphytic orchids on their original branches, i.e. the collectors have actually cut tree limbs in an effort to keep the orchid's root system intact.

In addition to this, we have seen many species of *Globba, Kaempferia, Boesenbergia* (Zingiberaceae); *Liparis, Habenaria, Geodorum* (Orchidaceae), *Cycas, Pandanus,* and other ground plants from the forest sold in pots.

Generally speaking, local collectors and the merchants of these plants are unaware (or could care less if they did know) that some of these species are rare or otherwise very limited in distribution. We have also heard that many of these plants become unhealthy, do not flower, or die away from their natural habitats.

A Bangkok garden with transplanted forest plants, photo J.F. Maxwell

Since many nations have made concerted efforts to protect their native fauna, it is our sincere hope that exploitation of native plants will also be controlled. Horticulturists have made significant achievements in cultivating numerous ornamental plants (both native and introduced) and we feel that prohibiting the sale of species taken from the forest would not infringe on their commercial interests to any great extent. In fact, prohibiting the collecting and sale of ferns, orchids, etc. from the forest would undoubtedly result in an increase in the sale of cultivated plants.

What is really sad about this matter is the fact that the remaining virgin forests are being disturbed by local collectors only for the temporary relief of urban residents from the filth and noise of the city. Numerous ecological niches, population levels of plants and animals, and other discrete environmental factors are being disrupted by this collecting. Therefore, even if the clear cutting of forests is curtailed, the vestige will look very strange without the large epiphytes and colorful ground flora if all these plants are allowed to be removed for stocking urban gardens.

HUNTING PRESSURE ON ORANG-UTANS IN SARAWAK

by Lord Medway

The international ban on zoos acquiring wild caught orang-utans may have been reasonably successful outside their source region, but the surviving wild populations continue to be subject to unremitting pressure. In Sabah, in 1964, at Poring – near the eastern boundary of Kinabalu National Park – I met men who readily admitted that they had shot and eaten the Maias (orang-utan), and now, in Sarawak, orang-utans are being hunted and killed for food. Charred remains of skin, skulls, and limb bones obtained in July 1975 from camp sites and field huts adjoining the forested area of the upper Sebuyau provide indisputable evidence. One skull (that of a young female) had been opened along the sagittal plane, obviously in order to extract the brain, and there can be no doubt that these animals had been eaten.

In Sarawak, in historic times, orang-utans have traditionally not been hunted for food. In fact, the Iban consider it taboo to kill these animals unless forced to do so in self defence. It is only recently, however, that the ancient customs regarding the killing of orang-utans have changed, and this is undoubtedly due to the scarcity of other animals which have always been hunted for food.

The use of shotguns against orang-utans, which can seldom be killed outright, inevitably involves great cruelty. The hunter can only hope to wound his quarry and bring it to the ground to be killed by a bush knife. A second skull from Sebuyau tells a grisly tale. Clearly seen is a deep diagonal slash slanting across the face from the right orbit, through the nasal region and the left upper jaw. This blow touched no vital organ and cannot have been the final cause of death, but it was delivered with such force that the upper jaw on the left side was fractured beyond the edge of the knife blade and largely detached from the cranium. The suffering of this orang-utan (an aged female) as she faced her attackers is horrible to imagine.

The Sarawak Government is aware of the threat to orang-utans, which have been totally protected by law for three decades. An Office of National Parks and Wildlife has been formed, and special reserves are envisaged. Yet in the rural districts the law is not respected, and present wildlife personnel include no trained field enforcement officers. To establish effective orang-utan reserves will necessitate the permanent dedication of large tracts of unspoiled lowland forest in the range of existing populations. Natural populations require about 1 sq. km. per animal, but it may be difficult to reserve such large areas – 100 sq. km. (24,710 acres) for a mere 100 orang-utans – in the face of demands for rural development land.

Orang-utan, photo H. Rijksen

Even if adequate sanctuaries can be set aside, the orang-utans there will only survive if their protection is supported by local sentiment. The opportunity seems to exist for a call to the Iban villagers, preferably through community leaders, to return to traditional attitudes towards orang-utan. A simultaneous campaign to encourage a greater reliance on domestic animals for meat would also be valuable. The cruelty issue is an influential aspect in urban educated societies, but perhaps less so in rural communities. In any event, it is now clear that the future of the orang-utans within the State is secure only if all Sarawakans unite in their efforts to protect the surviving remnants.

exerpted from: **Oryx,** *July 1976.*

TIGERNOTES

BORDER RANGES NATIONAL PARK, AUSTRALIA

In TIGERPAPER III:3 we included an article entitled "Border Ranges National Park – A Rain Forest Remnant" which described the present status of this unique area and the controversy between Australian conservationists and various commercial interests determined to exploit the area. Mr. David Waterhouse, one of our most attentive readers and frequent contributors, recently sent us a copy of the **Australian Conservation Foundation Newsletter**, vol. 8, nò. 7 (August 1976) which contained more information on the Border Ranges National Park. The following information is reproduced from this publication.

The new NSW State Government has made a number of moves on the Border Ranges National Park proposal and on logging of the rain forest in the region.

We understand that the Government has decided not to allow the building of a road onto Lever's Plateau, which will mean that the rain forest will not be logged for the time being at least.

An inter-departmental committee has been set up to examine the conflict between logging and nature conservation. It will consider the establishment of the Border Ranges National Park and employment problems of any timber workers who might be displaced by restrictions on logging as a result of the setting aside of the national park.

In a recent press statement the Premier, Mr. Wran, spoke of the "eventual" establishment of a Border Ranges National Park. This most likely means that at present the Government is contemplating allowing the logging of virgin rain forest at Wiangarie State Forest for another 10-20 years.

Any compromise involving the saving of the rain forest at Lever's Plateau at the expense of the much greater areas at Wiangarie is a most unsatisfactory result.

A paper presented at a recent Border Ranges Symposium in Queensland made it clear that it will take 800 years for the regrowth forest to reach maturity following logging. Evidence was presented to show that the 50 per cent canopy retention technique being currently used for logging at Wiangarie is seriously degrading the forest.

The Foundation has called on all members of the NSW Parliament to press for a moratorium on logging at Wiangarie. Conservationists must now step up their campaign to save Wiangarie.

We must not accept a delay of years in the establishment of the national park because the price would be the loss of its most precious asset – the virgin rain forest.

LEOPARDS IN BANGLADESH

The Government of Bangladesh has imposed a total ban on the killing, hunting, and trapping of leopard and clouded leopard, and has also forbidden the export of their skins. The clouded leopard is the rarer of the two, but both species are considered to be endangered in Bangladesh.

from: **Oryx**, *Feb 1976*

NILGIRI LANGUR

The Nilgiri langur, *Presbytis johni*, once found all along the western side of the Western Ghats in southern India, was hunted to the verge of extinction, mainly because people believed that this monkey's flesh had aphrodisiac and medicinal properties. Now, however, it seems to be recovering in several parts of its range. From 1968-71, G.U. Kurup, during a survey for the Zoological Survey of India (reported in the **Journal of the Bombay Natural History Society**, April 1975), found that the langurs were no longer to be seen in the neighbourhood of human settlements (for obvious reasons), but that numbers were building up in the Anamalai and Cardamom Hills, especially in the forest reserves, although not in the more settled and disturbed Nilgiri Hills. In 1974, the increase in numbers was much more noticeable and in some areas troops of langurs were to be seen every mile or so. He believes that if they are properly protected the populations will quickly recover.

from: **Oryx**, *July 1976*

INDIA'S THIRD GHARIAL SANCTUARY

The Government of Uttar Pradesh has declared a 400 sq. km sanctuary in Bahraich Division in the north of the State adjacent to the Nepal border. The sanctuary includes 19 km of the Girwa River.

The sanctuary, which was created under a Government of India/FAO/UNDP Crocodile Project, for which Dr. H.R. Bustard is Chief Technical Adviser, contains the largest single surviving population of gharial *(Gavialis gangeticus)* in India – about 20 individuals. This is the third sanctuary to be gazetted under the scheme – specifically for the endangered gharial (see **TIGERPAPER** II:4, and III:2 for background information).

The Government of Uttar Pradesh has been active in egg collecting for captive rearing of hatchlings and subsequent release into protected areas in the wild. Egg collection has taken place within the sanctuary and in widely dispersed areas in the State, and 345 hatchlings have been produced this year. This number is five times the estimated total gharial population in India. The hatching percentage obtained for 5 nests brought from the western side of the State was 92%.

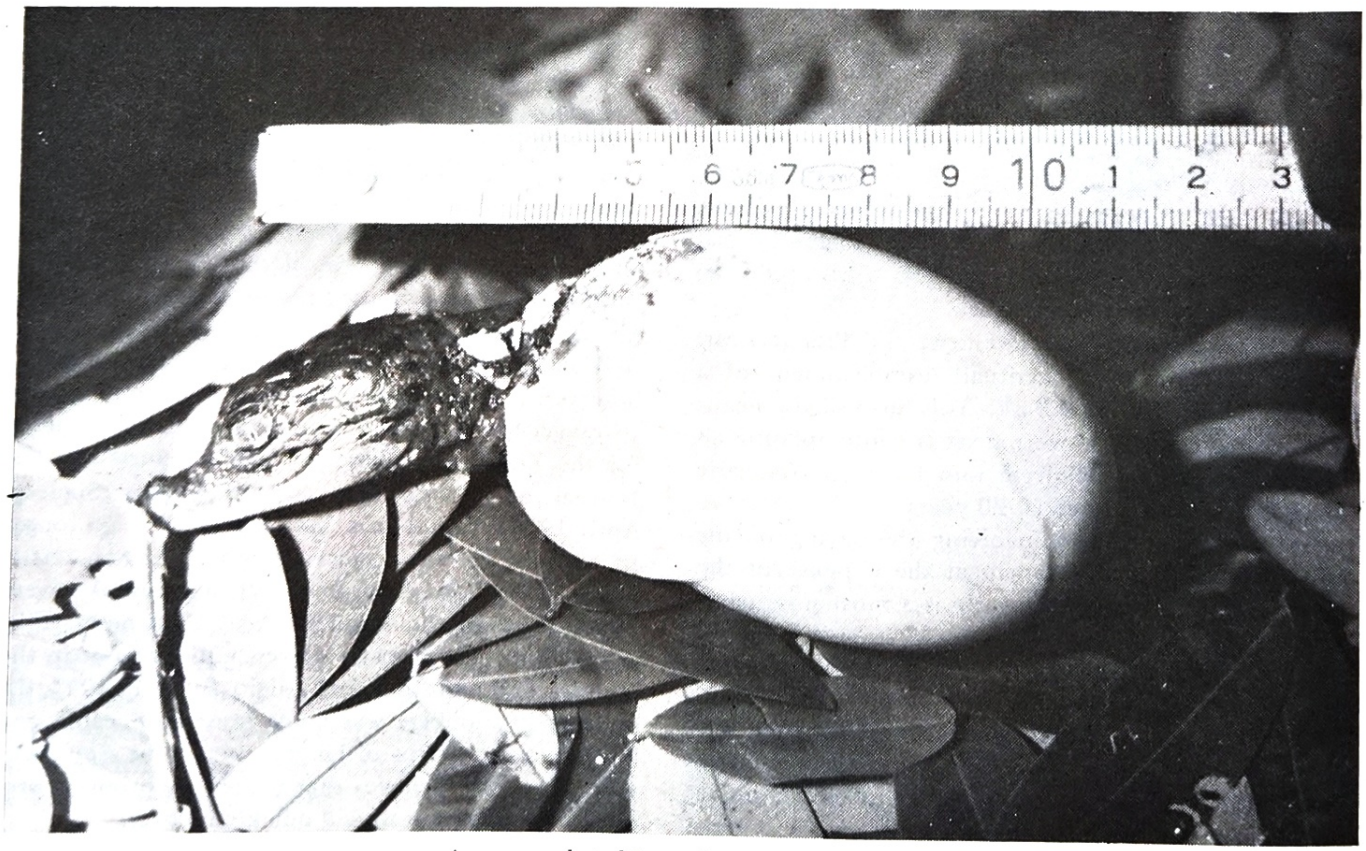
Like the other sanctuaries, the aim will be to manage the area in the interests of all wildlife. Whereas many sanctuaries have river boundaries, here the Girwa river is in the *sanctum sanctorum.*

Newly hatched taking their first swim

CROCODILE BREEDING

The Madras Crocodile Bank, the crocodile breeding centre initiated by the Madras Snake Park and sponsored by the Snake Park and World Wildlife Fund, had its first breeding success this year (**TIGERPAPER** III:3). A 7 ft. female laid 23 eggs out of which 22 hatched on 7 May. Another 6 ft. female laid 8 eggs all of which hatched on 24 June. One hatchling couldn't be traced, and of the remaining 7, 2 died a few days later. This was the first year this female laid. The hatchlings are being reared in separate enclosures at the Crocodile Bank.

The Crocodile Bank, which is due to be inaugurated this year, will breed and rear the three species of Indian crocodilians: the gharial *(Gavialis gangeticus),* mugger *(Crocodylus palustris),* and estuarine crocodile *(C. porosus).* The Crocodile Bank presently has 6 estuarine crocodiles, over 100 muggers, and 2 sub-adult gharials – which will hopefully breed when they are mature in 4 or 5 years.



A mugger hatching, photo Z. Whitaker

CANE TOADS – DEADLY TO QUEENSLAND'S FAUNA

The cane toad, introduced to Queensland in 1935 from Hawaii and originally from South America, is a highly toxic animal which has killed many animals in the State. The toad, originally conceived as a means of controlling the grey-back and frenchi beetles which destroy sugar cane, is probably now the most common vertebrate in eastern Queensland. Mr. M. Archer, curator of mammals, and Miss J. Covacevich, curator of reptiles at the Queensland Museum, have undertaken a study of this toad and have found that there is evidence that this animal is responsible for the virtual disappearance of the tiger cat in Queensland. Prior to 1935, tiger cats were reported frequently in Queensland, but now these cats can only be found in places where cane toads do not exist. Mr. Archer reports that his pet tiger cat died 30 minutes after taking one bite on one of these toads.

Other native animals which are known to have died after having either bitten or eaten cane toads include: land mullets, goanna, crows, kookaburras, and several species of snake. The only known common predator of these toads in Queensland is the freshwater snake which eats tadpoles and immature individuals, however this snake is also included in the diet of mature cane toads. In South America these toads are believed to be controlled by other species of toads competing for the same food and living space.

Cane Toad, Bufo marinus, *photo R. Kinne.*

The cane toad may also disrupt natural ecosystems by their varied diet which includes small snakes of several species, lizards, frogs, insects, and possibly small mammals, combined with their rapid and uncontrolled distribution. Mr. Archer and Miss Covacevich note that aside from the failure of cane toads to control these two beetle pests biologically, introducing another toad to control this one would be too risky since the final result could be the uncontrolled spread of two toad species and the extinction of several native animals. As it stands now, the cane toad not only represents a distinct threat to the safety of many native animals, but also competes for food and living space with other animals which do not feed on it.

PHEASANT NEWS

Lt. Col. James Roberts, a member of the International Council of Bird Preservation – Pheasant Group in Nepal has recently reported that during April and May of this year he did a trek of about one month in west Nepal and found the Cheer Pheasant *(Catreus wallichi)* present in suitable localities in apparently satisfactory numbers. Its eastern limit, so far as he could ascertain, is the Kali Gandaki River valley. This is most welcome news in view of this species precarious position in other parts of its range.

Dr. Boonsong Lekagul, International Council of Bird Preservation Pheasant Group member for Thailand, has sent a short report on the present situation of pheasants and other game birds in that country. Thailand has twenty two species of Phasianidae, including three species of quail, a francolin, eight species of partridge, and ten species of pheasant: including the Kalij, the Silver, Crested Fireback, Siamese Fireback, Red Jungle Fowl, Hume's, Burmese Grey Peacock Pheasant, Malay Brown Peacock Pheasant, Great Argus, and Green Peafowl. Some of the quail and partridges are not uncommon, but all pheasants (with the exception of the Red Jungle Fowl) are now very rare. This is closely connected with the very rapid destruction of forests in all parts of Thailand.

On the positive side, Thailand is now developing an extensive set of National Parks and Wildlife Reserves which will offer safe refuge for most pheasants if proper enforcement is provided. In addition, all species of pheasant have now been placed in Category II of the protected list in Thailand. This means that no hunting is allowed, no pheasants can be sold, and a private individual can posses only two specimens of each species. Zoo to zoo trade is allowed, but only with a special permit.

from: **The Pheasant Trust Newsletter,** *August 1976*

NEWS FROM WWF/IUCN

WWF'S OPERATION RAIN FOREST INTERNATIONAL DRAWING COMPETITION

At a colourful ceremony organized by World Wildlife Fund – India, Western Region, Mrs. Mehboob Nasrulla, former sheriff of Bombay, presented awards to the international, national, and local Bombay winners of the "Operation Rain Forest" International Drawing Competition which was sponsored by the World Wildlife Fund in serveral countries throughout the world – including India. One child from Bombay was awarded an international prize and 5 Bombay youngsters won all-India prizes. Over 1,000 children from the prize winning schools along with teachers and principals were present at the function, which was held at the Regal Theatre on 18 September 1976.

In India, over 25,000 children from 11 centres participated in the competition. This is the second time that WWF has organised such a competition and the competition is becoming tremendously popular with school children all over the country. The competition in India was sponsored by Cadbury Fry (India) Private Limited.

World Wildlife Fund – India, Revolving Trophy

The Balmohan Vidya Mandir High School, Dadar, Bombay was presented with the newly instituted World Wildlife – India revolving trophy. The trophy is a silver plated panda (the international symbol of the World Wildlife Fund) mounted on a rose wood stand. This was the first time that the World Wildlife Fund trophy has been awarded. It was awarded to the Balmohan Vidya Mandir, whose student, Miss Vaidya Prabha Anand, age 13 years, won the first prize at the all-India level, and who was also awarded a prize at the international level.

The competition was organised by World Wildlife Fund – India as a part of the Fund's international campaign for 1975-76 "Operation Rain Forest" to arouse the interest and awareness among children in this particular aspect of nature.

Mrs. Mehboob Nasrulla, speaking at the function, urged educators to encourage their students to actively involve themselves in the preservation of nature and more specifically to join the youth movement of the World Wildlife Fund – the Nature Clubs of India (TIGERPAPER III:3).

SNAKE EXPORT BAN IN INDIA

According to news reports in the press, the Government of India has now imposed a total ban on the export of venomous and non-venomous snakes. A report from **Business Standard,** Calcutta, states that the export of venomous and non-venomous snakes (dead or alive or parts thereof or produce therefrom) is banned with immediate effect. The Export Control Order has been amended accordingly. No further export of skins of non-venomous snakes and of non-venomous live snakes will be allowed.

from: **World Wildlife Fund–India Newsletter** *no. 17, 1976.*

SOUTH PACIFIC CONSERVATION MEETINGS

Two important meetings – both held in Apia, Western Samoa, this June – indicate that the South Pacific is likely to be the scene of some exciting developments in conservation in the coming years.

The first meeting, convened by the Government of Western Samoa (an IUCN State Member) from 9 to 12 June, concluded a Convention on Conservation in the South Pacific. The Convention laid down that parties to it shall encourage the creation of protected areas and shall safeguard indigenous fauna and flora from unwise exploitation. Special provision is made for species threatened with extinction.

The meeting was chaired by the Honourable Ulualofaiga Talamaivao Masoe Niko, Minister for Justice and Cultural Affairs, Western Samoa, and leader of the Western Samoan Delegation. It was opened by the Prime Minister of Western Samoa, the Honourable Tupuola Efi.

The second meeting, a regional symposium on conservation of nature in the South Pacific, was convened by IUCN and the South Pacific Commission from 14 to 17 June. The symposium made a number of far-reaching recommendations emphasizing the importance of ecodevelopment, appropriate technology, traditional environmental knowledge and conservation practices, and the involvement of local people –especially at village level.

The symposium, chaired by the Honourable Tupui A. Henry, Minister for Justice, Land Survey, Physical Planning, Internal Affairs and Conservation, Cook Islands, is likely to go down as a landmark in the establishment of ecodevelopment as a practical and promising option for economies anxious both to sustain their natural resources for the future and to make the best use of them today.

The symposium considered papers by Arthur L. Dahl on a "Regional Ecosystems Survey of the South Pacific Area"; Robert Allen on "Ecodevelopment and Traditional Natural Resource Management in the South Pacific"; Jimoh Omo-Fadaka on "A Framework for Ecodevelopment in South Pacific Island Countries"; Suliana Siwatibau on "Traditional Conservation Practices for Modern Pacific Societies"; G. Carleton Ray on "Critical Marine Habitats"; Raymond Dasmann on "The South Pacific Programme of IUCN"; and Gyril de Klemm on "The Concept of World Parks and International Law".

The symposium also heard presentations on the SPC special project on conservation by Arthur L. Dahl, UNESCO MAB Project 7 by Bernard Salvat, UNEP plans for the Pacific by Kai Curry-Lindahl, and the law of the sea by Ernst Willheim.

It was generally agreed by participants that the symposium marked a great step forward not only for conservation in the South Pacific but also for the practical integration of conservation with development. IUCN expects a number of excellent conservation and ecodevelopment projects to arise out of this meeting.

from: **IUCN Bulletin,** *August 1976*

WWF/IUCN LAUNCH MAJOR ELEPHANT CONSERVATION PROJECT

Heavy poaching of elephants for ivory in recent years has aroused widespread fears that they are threatened with extinction in the near future. Nevertheless, no one knows just how many elephants there are in Africa and Asia, and the situation has been confused by large concentrations of elephants in some areas, while they have disappeared from others.

To establish a true picture of the elephant situation and to work out conservation measures, the World Wildlife Fund (WWF) and the International Union for Conservation of Nature and Natural Resources (IUCN) have now launched a three year project under the overall guidance of Dr. Iain Douglas-Hamilton, one of the leading experts on the African elephant, who is Chairman of the IUCN Elephant Group. The New York Zoological Society is actively associated with the project.

Dr. Douglas-Hamilton will concentrate on the African elephant, working in association with Dr. H. Croze, while the Asiatic elephant study will be supervised by Mr. J.C. Daniel, curator of the Bombay Natural History Society, who is also the co-chairman of the IUCN's Survival Service Commission's Elephant Specialist Group, and Mr. Robert Olivier, who has recently been studying the elephant in Malaysia.

Asiatic elephants, photo:Z. Futehally, copyright WWF

Despite the heavy toll from poaching, experts do not consider the African elephant to be seriously endangered so far as a species, although they believe that it may disappear from many of its normal haunts.

The Asiatic elephant, which is of a different genus, is found from India through continental southeast Asia and on the islands of Sri Lanka and Sumatra. So far only the Sri Lanka subspecies has been included in IUCN's Red Data Book of Endangered Species, although there is serious concern about the threat to the elephant in its other Asian habitats. (See TIGERPAPER III:2 and III:3 for articles on elephant conservation in Sri Lanka.)

LOSS OF HABITAT

Apart from poaching for ivory, the main threat to the elephants is loss of habitat. Many of their traditional areas have been or are being converted into agriculture or settlements, and their migration routes are being disrupted. As a result, attempts to continue their normal way of life frequently bring them into conflict with humans.

While the overall picture is one of rapid decline, a paradoxical situation has developed in many national parks and reserves where elephant numbers have increased. There the vegetation may be destroyed, resulting in malnutrition of elephants and changes in the local ecology affecting a wide range of other species. Some authorities have suggested that this could even result in the elephant becoming virtually extinct in areas set aside for their conservation.

The World Wildlife Fund/IUCN project is scheduled to last three years and is to include a survey of the whole ecological spectrum of man, elephant, and habitat interactions – including human attitudes towards elephants. It will also include an investigation into the impact of the international ivory trade on elephant populations.

As the project develops, areas for action will become apparent and the methods necessary to ensure the conservation of elephants will also be determined.

Many research projects on elephants have been or are being carried out and the active cooperation of all concerned is being sought. A broad picture of the elephant situation will be established through questionnaires which will indicate numbers and current ranges. More detailed studies will then be undertaken on the population dynamics of selected populations, particularly on the effects of range contraction, expanding human settlement, and poaching.

IVORY

At the same time a survey of the ivory trade will permit an assessment of the continuing killing of elephants and the ecological implications of the trade. This will involve contacts with officials of exporting and consuming nations, and with ivory dealers and shippers.

In the case of ivory, there will always be a considerable supply for the market resulting from normal deaths, and the information from the survey will help to develop proposals for legislative action to end illegal ivory trading and to rationalise elephant exploitation.

It is thought that the establishment of a cartel of producing nations, such as the Diamond Board, might protect the resource while ensuring a stable revenue, thus giving the producer nations a vested interest in good management of their elephants.

Towards the end of the project it is planned to hold an international conference on management of elephants and their habitats in which people actively involved in elephant research, conservation, and legitimate exploitation would participate.

from: **World Wildlife Fund – India Newsletter,** *October 1976.*

PUBLICATIONS

INTERPRETING THE ENVIRONMENT

Edited by Grant W. Sharpe, 1976. John Wiley and Sons, New York, 556 pages, US$ 14.95.

At last a book has been written that should interest national park administrators throughout the world. **Interpreting the Environment** shows how to establish an effective education service for park visitors. It is a how-to-do book and also a philosophical summary of all that has been written over the years on the fascinating topic of "nature interpretation."

Professor Sharpe and his panel of two dozen international experts convincingly demonstrate that interpretation is not a luxury, but a cornerstone of good park management. Interpretive programs not only foster an awareness and understanding of park features, but they can also present an opportunity to change the attitudes of visitors about lands held in public trust.

Grant Sharpe is the perfect man to edit this important work, being both an experienced field naturalist and distinguished educator at the University of Washington. The 556 pages of text are well illustrated with hundreds of photographs and charts, most of which are being published for the first time. The bibliography at the end of each chapter gives further help to the park manager interested in following up sub-topics in greater detail. In summary, this is a most practical book and should be on the bookshelf of every park administrator.

Bruce E. Weber
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WORLD PHEASANT ASSOCIATION JOURNAL, 1975 – 1976

We recently received the first issue of this journal and it is obvious from its form and content that the World Pheasant Association (WPA) has achieved a great deal since its foundation on 20 June 1975 (**TIGERPAPER** III:2).

This issue, edited by Iain Grahame and Stephen R. Wylie, includes 18 articles (120 pages) on pheasants, e.g. Conservation of the Galliformes, the Himalayan Blood Pheasant, the Japanese Copper Pheasant, Malayan Pheasants, Pheasant Conservation in Iran, Avian Tuberculosis, etc.; plus notes for WPA members and 20 pages of ad's relating to pheasants. The articles are well written; adequately illustrated with tables, drawings, and photographs (some in color); and completed with references.

The WPA Journal is a high quality publication (including the paper) and we congratulate the WPA on producing such a fine issue and offer our encouragement for them to keep up the excellent work.

For more information about the WPA write to:

World Pheasant Association
Daws Hall
Lamarsh, Bures, Suffolk
C08 5EX
England

TROPICAL RAIN FORESTS OF THE FAR EAST

by T.C. Whitmore. Oxford University Press. 1975. 282 pp., 171 figs., 29 tables. £ 12.50.

This book is made up of five parts, containing a total of nineteen chapters. Part One begins with a general description of the composition and distribution of tropical rain forests in the Far East. This is followed by a comprehensive and excellently illustrated (28 photographs) chapter on the structure of the forest and the interactions between its plant and animal components. Part Two discusses the seasonal changes in the climate and plant and animal behaviour and their possible correlation. Part Three covers the dynamics of the development of the forest from seed dispersal through seedling establishment to the development of the stand. These are followed by a short chapter on the ecological basis of rain forest silviculture and a fuller one on growth rates and yield. Part Four, with eight chapters, takes up almost half the book. It begins with an account of forest soils (by guest writer C. P. Burnham) and is followed by descriptions of the various wet and dry land rain forest formations, monsoon forests, montane forests, coniferous forests, and animal life in the forests. Variation within the tropical lowland evergreen rain forest is discussed in one full chapter. Part Five reviews the impact of man's industrial and traditional activities on the tropical rain forest ecosystem. It concludes with a final chapter on the future of the tropical rain forest and emphasizes the need and urgency to conserve adequate representa-

A lush epiphytic flora is a characteristic of tropical rain forests; Nature Malaysiana

tive areas of the various types of rain forest formations for scientific and social purposes before it is too late.

Through his vast experience and knowledge of the subject, Dr. Whitmore has managed to produce a book which should be very useful to a wide range of readers. The forest ecology student or experienced forest/land manager, who may not have had formal scientific training, will find many ecological situations described and discussed in fairly great detail with the effective aid of photographs (100), diagrams (71) and tables (29). The research worker will also find in this book a useful synthesis of knowledge on the tropical rain forest ecosystem and the 700 odd references will be particularly helpful.

However, the great amount of data presented, coupled with the use of some grammatically complex sentences make their digestion somewhat slow. The use of section numbers instead of page numbers in the indices and bibliography also means taking more time to locate specific items in the text. But these are only minor points and should not detract from the value of the book as a very useful and convenient source of information and references on the subject. This is an important contribution to our knowledge as management and conservation efforts in the tropical Far East, as in all other developing areas, have always been hampered by inadequately documented information. Unfortunately, the price of £12.50 for the book may put it out of the reach of the people who should read it most – those of the Far East.

H.T. Tang

from: **The Commonwealth Forestry Review,** *55(2), no. 164; June 1976.*

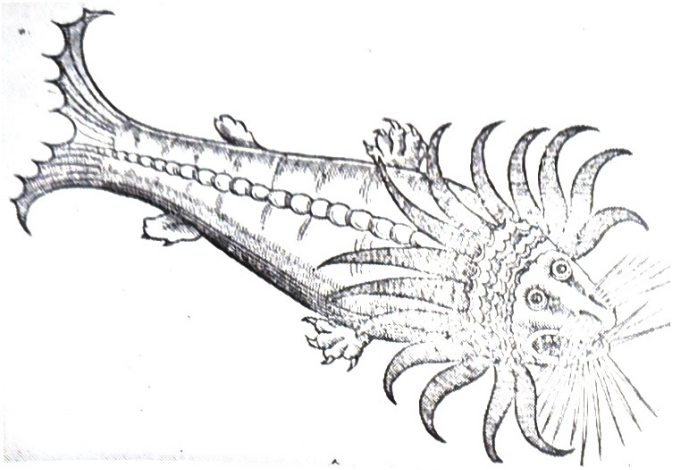
NATURE MALAYSIANA

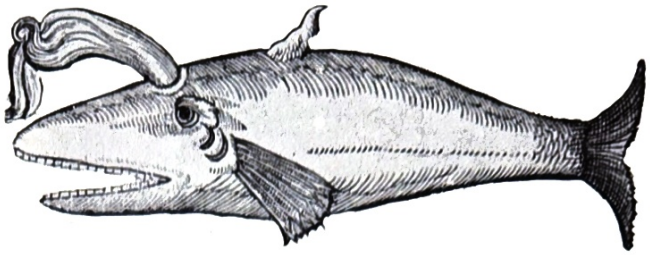
Malaysia is a tropical wonderland and an evergreen paradise. Its rain forest houses one of the world's richest and unique animal and plant assemblages. There are some 200 species of mammals, 500 kinds of birds, 200 types of fish, scores of amphibians and reptiles, thousands of kinds of insects and other invertebrate animals, 3000 species of trees, 8000 kinds of flowering plants and even more of lower plant life. However, human exploitation and destruction of the forest and geological formations are threatening the survival and existence of many of Malaysia's native treasures.

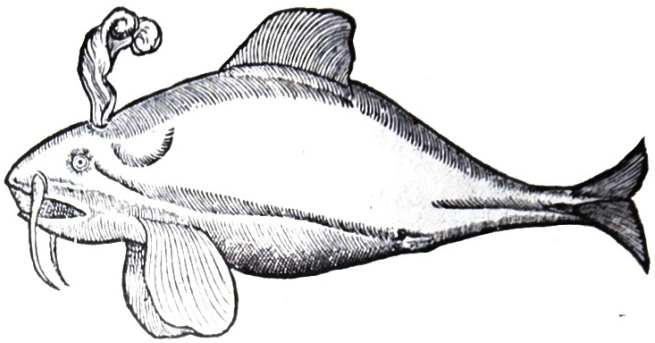
Nature Malaysiana is a new magazine concerning the rich and varied natural heritage of Malaysia. The first issue (July 1976) contains the following articles: Our Natural Heritage, Snakes – Facts and Fallacies, Malaria Parasites, Spiders Galore, Wild Orchids, Flower Mantis, Horned Frog, and Malayan Elephant – its Management and Problems. All articles are richly illustrated with full colours. It is evident that this magazine aims to cover a wide range of topics in each issue. The articles, written in a simple yet authoritative manner, will provide interesting and very informative reading. It is indeed hoped that this magazine will help bring about a greater awareness among people of all walks of life in Malaysia's unique and splendid natural heritage.

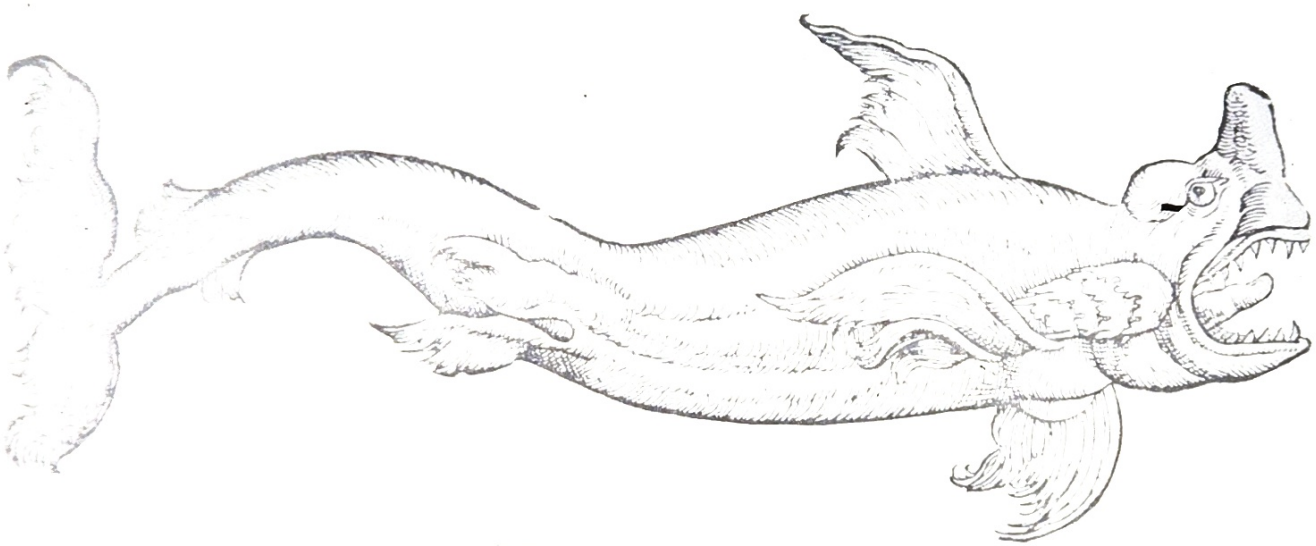
Nature Malaysiana is available at M$ 2.50 (US$ 1.50) per copy (post paid) from:

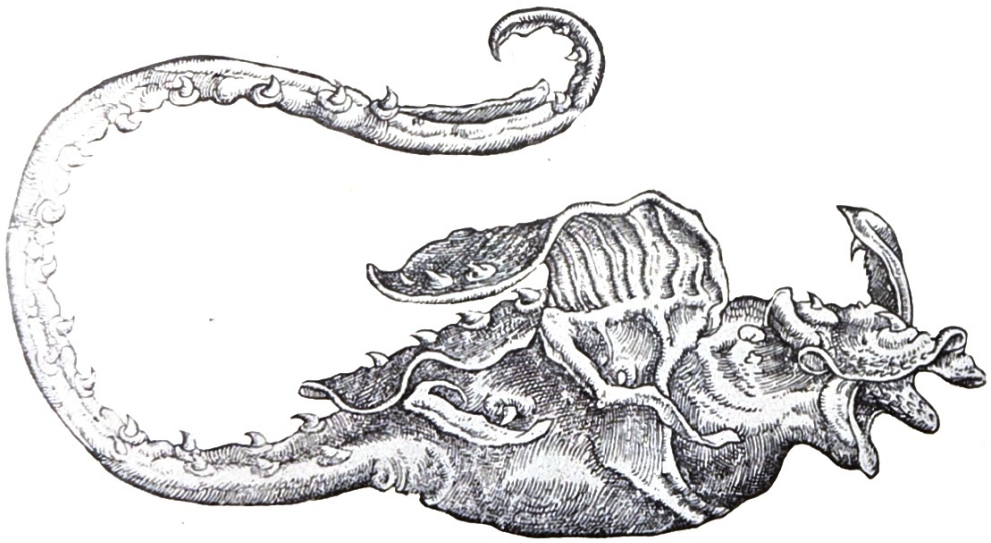
International Book Service
33 Jalan 20/16
Petaling Jaya
Selangor, Malaysia











We recently received a letter of complaint from one of our more remote readers who notes that, in comparison to all the other animals illustrated in TIGERPAPER, marine mammals have been neglected. Our friend has, therefore, provided us with some pictures of his favorite whales, etc. which are illustrated here.

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